DRILLHOLE RECORD

VIBRO	CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH11
		SHEET 1 OF 2

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 827664.41 N 841493.45	DATE : 26/04/2011 to 28/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 26.26 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level +26.26	Depth (m) 0.00	Legend	Grade	Description
25/04/2011	SW													Firm, brown (7.5YR 5/4), dappled light brown and purplish brown, sandy SILT with some angular to subangular fine to medium gravel sized highly decomposed and moderately decomposed rock fragments. (COLLUVIUM)
26/04/2011 27/04/2011								En	A ↕ 0.50	+25.76	0.50		V	Extremely weak, reddish brown, dappled purplish brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
								En	B ↕ 1.00 (INSPECTION PIT)					
								En	C ↕ 1.50	+24.76	1.50		V	Extremely weak, brown, dappled light grey and light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with some angular fine to coarse gravel sized quartz fragments and angular cobble sized quartz)
			70	92					1 2.50					
									2 2.60	+23.66	2.60		V	Extremely weak, brown, dappled light brown and grey completely decomposed meta-SILTSTONE. (Slightly sandy SILT with occasional angular fine to medium gravel)
	SW 3.05							2,5,7,8,9,11 N=35	3 2.70					
	PW	0.85m at 18:00						170 bls En	4 3.00					
				93					5 3.05					
27/04/2011 28/04/2011		Dry at 08:00						4.68×10^{-7} m/sec	6 3.50	+22.71	3.55		V	
			70	89					7 3.55				IV	Weak to moderately weak, reddish brown, dappled brown and purplish brown, highly decomposed meta-SILTSTONE. (Recovered as silty angular COBBLE with some angular fine to coarse gravel)
	PW 4.33								8 4.45	+21.71	4.55			
			70	92	13	0	>20		T2 I O I 5.15				III	Moderately strong, reddish brown, dappled purplish brown, moderately decomposed meta-SILTSTONE. Joints are very closely to closely spaced, rough and smooth planar, extremely narrow to very narrow, iron and manganese stained, dipping 20° to 30°, 40° to 50° and 50° to 60°.
							20.0							
			70	91	55	31	5.6		T2 I O I 5.70					
							12.8							
			70	43	21	0	NR		T2 I O I 5.98	+20.44	5.82		V	From 5.82m to 5.98m : No recovery, inferred to be completely decomposed SILTSTONE.
										+20.28	5.98		III	
							>20			+20.06	6.20			
			70	96	59	43	20.0		T2 I O I 6.66				II	Strong, light grey, dappled brown and reddish brown, slightly decomposed meta-SANDSTONE. Joints are closely spaced, locally very closely and medium spaced, rough planar and rough stepped, extremely narrow, iron and occasional manganese stained, dipping 10° to 20°, 40° to 50° and 50° to 60°. From 7.10m to 7.15m : With quartz veins 10mm thick, dipping 20° to 30°.
							5.5							
			70	108	79	61	17.2		T2 I O I 7.27					
			70	100	64	58	3.4		T2 I O I 7.93					From 7.70m to 7.75m : With quartz veins 10mm thick, dipping 20° to 30°.
							11.1							
			70	88	47	24			T2 I O I 9.03	+17.91	8.35		II	Strong, grey, slightly decomposed meta-SILTSTONE. Joints are medium spaced, locally closely spaced, rough and smooth planar, occasional rough stepped, extremely narrow, iron and manganese stained, dipping 20° to 30°, 30° to 40° and 50° to 60°. From 8.50m to 9.10m : With firm to stiff, orangish brown, sandy silt infilled joints 1mm to 2mm thick, dipping subvertically. From 8.80m to 9.10m : With quartz veins 10mm to 12mm thick, dipping 70° to 80°. From 9.03m to 9.38m : With slickensided planar joints,
							>20							
							4.4							
			70	98	79	63	15.0		T2 I O I	+16.88	9.38		III	
							4.2			+16.71	9.55		II	

↕ Disturbed sample
■ Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	07/05/2011
CHECKED	E. Leung
DATE	09/05/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A falling head permeability test was carried out from 3.00m to 4.50m depth.
3. An acoustic televiewer survey was carried out from 4.55m to 11.51m depth.
4. A piezometer was installed at 4.05m depth.

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH11

CONTRACT NO. : GE/2009/15

SHEET 2 OF 2

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 827664.41 N 841493.45	DATE : 26/04/2011 to 28/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 26.26 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
			70	98	79	63			T2 01 10.27				II	dipping 70°. From 9.38m to 9.55m : Moderately strong, moderately decomposed SILTSTONE.
							4.2							
11			70	100	92	86	10.0		T2 01					
28/04/2011		0.85m at 18:00					3.3		11.72	+14.54	11.72			
12														End of Investigation Hole at 11.72m.
13														
14														
15														
16														
17														
18														
19														
20														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	07/05/2011
CHECKED	E. Leung
DATE	09/05/2011

REMARKS

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH12

CONTRACT NO. GE/2009/15

SHEET 1 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM51	E 827845.72 N 841696.56	DATE : 04/04/2011 to 13/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +23.90 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
04/04/2011	PW								+23.90 0.00					Firm, light brown (7.5YR 6/4), sandy SILT with some angular to subangular fine to coarse gravel sized highly decomposed rock fragments. (COLLUVIUM)
								En	A INSPECTION PIT 0.50					
								En	B 1.00					
								En	C 1.50	+22.40	1.50			
			60	62					1 2.50				V	Extremely weak to very weak, light brown, dappled brown, completely decomposed meta-SANDSTONE. (Silty fine to coarse SAND with some angular fine to medium gravel)
									2.60	+21.30	2.60			
			60	87					3 3.60				V	Extremely weak, light brown, dappled reddish brown, completely decomposed meta-SILTSTONE (Slightly sandy SILT)
									4 3.70					
		2.50m at 18:00						5,6, 7,10,10,12 N=39	5 3.80					
04/04/2011									6 4.10					
06/04/2011		Dry at 08:00		93				200 blows	En 7 4.15					
									4.60	+19.25	4.65			
			60	93					8 4.65				V	Extremely weak to very weak, light brown, dappled brown, completely decomposed meta-SANDSTONE. (Silty fine SAND with some angular fine to medium gravel)
									9 5.65					
									10 5.75					
								7,10, 16,23,28,33 N=100	11 5.85					
									12 6.15 6.20					
										+17.30	6.60			
			60	94	7	0	>20 NI		6.60 T2101				III	Moderately strong, locally moderately weak, light brown, dappled brown, moderately decomposed meta-SANDSTONE. Joints are very closely to closely spaced, occasional medium spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20°, 50° to 60° and 60° to 70°.
							14.8		7.50					
			60	95	25	25	>20 4.0 >20		T2101	+15.90	8.00			
		2.90m at 18:00											IV	From 8.00m to 8.50m : Weak to moderately weak, highly decomposed SANDSTONE.
06/04/2011										+15.40	8.50			
07/04/2011		7.60m at 08:00							8.50 T2101	+15.20	8.70		III	
			60	30	0	0	NR						V	From 8.70m to 8.90m : No recovery, inferred to be completely decomposed SANDSTONE.
									8.90	+15.00	8.90		IV	Weak to moderately weak, light brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular fine to coarse GRAVEL with some angular cobble)
			60	0										
									13 9.70 9.80	+14.10	9.80			
			60	80	17	0	10.0		T2101	+13.90	10.00		III	Moderately strong, greyish brown, moderately decomposed

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	14/04/2011
CHECKED	E. Leung
DATE	15/04/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A falling head permeability test was carried out from 15.50m to 17.00m depth.
3. A piezometer was installed at 29.70m depth.
4. A sample of equipment blank and field blank were collected.

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH12

CONTRACT NO. GE/2009/15

SHEET 2 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	**CO-ORDINATES**	**W.O.NO.** GE/2009/15.22
MACHINE & NO.	VBM51	E 827845.72 N 841696.56	**DATE :** 04/04/2011 to 13/04/2011
FLUSHING MEDIUM	Water	**ORIENTATION** Vertical	**GROUND LEVEL** + 23.90 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW						>20		T2 1.00 10.10	+13.80	10.10		IV	meta-SANDSTONE.
			60	0					14 10.50 10.60	+13.30	10.60		IV	Joints are very closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 20° to 30°.
			60	73	60	33	6.7		T2 1.00 10.90	+13.00	10.90		III	From 10.00m to 10.10m : Weak to moderately weak, highly decomposed SANDSTONE.
11			60	0									III	Weak to moderately weak, brown, dappled light brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular fine to coarse GRAVEL with occasional angular cobble)
									15 11.80 11.90					Moderately strong, light grey, dappled light brown, moderately decomposed meta-SILTSTONE.
12			60	90	33	33	>20			+11.80	12.10		III	Joints are closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 40° to 50°.
							8.8		T2 1.00 12.50					Moderately strong, light grey, moderately decomposed QUARTZ VEIN, highly fractured.
13			60	94	44	0	>20							Moderately strong, grey and white, dappled light brown, moderately decomposed meta-SILTSTONE.
							16.7		T2 1.00 13.30					Joints are closely spaced, locally very closely spaced, rough planar and rough stepped, locally smooth planar, extremely narrow, iron and occasional manganese stained, dipping 10° to 20° and 50° to 60°.
	PW 13.50 HW		60	0						+10.60	13.30		IV	From 12.25m to 12.50m : With sandy silt infilled 2mm to 5mm thick, dipping 70° to 80°.
14		5.60m at 18:00							16 13.90 14.00					Weak to moderately weak, locally moderately strong, light brown, highly decomposed meta-SILTSTONE. (Recovered as silty sandy angular fine to coarse GRAVEL with some angular cobble and quartz fragments)
		07/04/2011	60	57	23	0	>20		T2 1.00 14.20	+9.70	14.20			
		08/04/2011 11.00m at 08:00					10.0		14.30	+9.60	14.30		III	From 14.20m to 14.30m : Moderately strong, moderately decomposed SILTSTONE.
15			60	0									III	Moderately strong, light grey, dappled light brown, moderately decomposed QUARTZITE. Fractured.
									17 14.90 15.00					
			60	100	20	0	>20		T2 1.00	+8.55	15.35			
							16.7			+8.45	15.45			From 15.35m to 15.45m : Quartz vein.
									18 15.50				IV	
			60	95				9.69×10^{-7} m/sec						Weak to moderately weak, light brown, dappled greyish brown, highly decomposed meta-SILTSTONE. (Slightly sandy silty angular fine to coarse GRAVEL with occasional angular cobble)
16									19 16.50 16.60					
		3.90m at 18:00						8,8, 12,18,25,26 N=81	20 16.70					
		08/04/2011 11.10m at 08:00 11/04/2011						423 blows	21 17.00 17.05					
17								En	22					
				74					23 17.39 17.44	+6.46	17.44			
			60	78	17	0	>20		T2 1.00	+6.20	17.70		III	Moderately strong, light brown, dappled light grey and brown, moderately decomposed meta-SILTSTONE.
									17.80	+6.10	17.80		IV	Fractured.
18			60	0										From 17.70m to 17.80m : Quartz vein.
														Weak to moderately weak, greyish brown, dappled light grey, highly decomposed meta-SILTSTONE. (Recovered as silty sandy angular fine to coarse GRAVEL with some quartz fragments)
									24 18.57 18.67	+5.23	18.67			
		4.60m at 18:00	60	100	24	0	>20						III	Moderately strong to strong, light grey, moderately decomposed QUARTZ VEIN.
19		11/04/2011					17.6		T2 1.00 19.17	+4.73	19.17			Joints are very closely to closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 60° to 70° and 70° to 80°.
		12/04/2011 12.20m at 08:00	60	47	0	0	>20			+4.55	19.35		III	
							NR		T2 1.00 19.55	+4.35	19.55		V	
			60										III	Moderately strong, light grey, moderately decomposed QUARTZ VEIN. Fractured.
20														From 19.35m to 19.55m : No recovery, inferred to be

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	14/04/2011
CHECKED	E. Leung
DATE	15/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH12

CONTRACT NO. GE/2009/15

SHEET 3 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	**CO-ORDINATES**	**W.O.NO.** GE/2009/15.22
MACHINE & NO.	VBM51	E 827845.72 N 841696.56	**DATE :** 04/04/2011 to 13/04/2011
FLUSHING MEDIUM	Water	**ORIENTATION** Vertical	**GROUND LEVEL** + 23.90 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW		60	0						+3.90	20.00		III	completely decomposed SILTSTONE. See sheet 2 of 4
			60	0					25 20.55 20.65					
									26 20.81 20.91					
21			60	87	0	0			T2 I01 21.21					
			60	83	0	0	NI		T2 I01 21.51	+2.30	21.60			
			60	89	0	0	NR		T2 I01	+2.20	21.70		IV	Weak to moderately weak, greyish brown, highly decomposed meta-SANDSTONE. Fractured.
22									21.90	+2.00	21.90		V	From 21.70m to 21.90m : No recovery, inferred to be completely decomposed SANDSTONE.
			60	0									III	Moderately strong, greyish brown, dappled light brown and light grey, moderately decomposed QUARTZITE. Fractured.
		5.60m at 18:00												
23	12/04/2011 13/04/2011	12.13m at 08:00	60	63	0	0	>20		27 22.90 23.00	+0.80	23.10			
							NR		T2 I01	+0.65	23.15			From 23.10m to 23.15m : Quartz vein.
									23.40	+0.50	23.40		V	From 23.25m to 23.40m : No recovery, inferred to be completely decomposed SILTSTONE.
24			60	0									V	Extremely weak to very weak, greyish brown, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with some angular fine to medium gravel)
									28 24.40 24.50	-0.60	24.50			
			60	66	16	0	NI						III	Moderately strong, locally moderately weak, brown, dappled light brown, moderately decomposed meta-SILTSTONE. Joints are very closely to closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20°, 20° to 30° and occasional 70° to 80°.
25							12.5		T2 I01	-1.05	24.95			
							NI			-1.15	25.05		IV	
							NR		25.33	-1.43	25.33		V	
			60	100	69	53	15.6		T2 I01				III	From 24.95m to 25.05m : Weak to moderately weak, highly decomposed SILTSTONE.
							6.7							From 25.05m to 25.33m : No recovery, inferred to be completely decomposed SILTSTONE.
26									25.95					
			60	95	19	11	>20		T2 I01					
							10.0			-2.80	26.70		IV	From 26.70m to 27.00m : Weak to moderately weak, highly decomposed SILTSTONE.
27							>20			-3.10	27.00		V	Extremely weak to very weak, brown, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with some angular fine to medium gravel)
			60	0					27.00					
28									29 27.90 28.00	-4.10	28.00			
			60	86	0	0	NI			-4.30	28.20		III	Moderately strong, locally moderately weak, light brown, dappled brown, moderately decomposed meta-SILTSTONE.
							6.7		T2 I01	-4.60	28.50		IV	
			60	84	32	26	>20		28.50				III	Joints are very closely spaced, locally closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20° and 20° to 30°.
29									T2 I01	-5.10	29.00			From 28.20m to 28.50m : Weak to moderately weak, highly decomposed SILTSTONE.
			60	0					29.00				V	Extremely weak to very weak, greyish brown, dappled brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with occasional angular fine to medium gravel)
	HW 29.50													From 29.40m to 29.50m : With some angular fine to coarse gravel sized quartz.
									30 29.40 29.50	-5.60	29.50		IV	
			60	93	0	0	NI		T2 I01	-5.90	29.80		V	
30		7.20m					NA							

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	14/04/2011
CHECKED	E. Leung
DATE	15/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH12
	SHEET 4 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM51	E 827845.72 N 841696.56	DATE : 04/04/2011 to 13/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +23.90 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
13/04/2011		at 18:00	60	93	0	0	NA		T2 01 30.20	-6.30	30.20		V	From 29.50m to 29.80m : Weak to moderately weak, light brown, highly decomposed meta-SILTSTONE. (Recovered as sandy SILT with some angular fine to coarse gravel) End of Investigation Hole at 30.20m.

Disturbed sample	Standard penetration test
Piston sample	In-situ vane shear test
U76 undisturbed sample	Permeability test
U100 undisturbed sample	Pressuremeter test
Mazier sample	Packer Test
SPT liner sample	Acoustic or optical televiewer survey
Water sample	Piezometer tip
En Environmental Sample	Standpipe

LOGGED	T. C. Yip
DATE	14/04/2011
CHECKED	E. Leung
DATE	15/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO	HOLE NO. KTN-BH13
CONTRACT NO. : GE/2009/15	SHEET 1 OF 8

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 828111.84 N 841776.61	DATE : 11/07/2011 to 25/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 17.16 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
11/07/2011	SW								+17.16	0.00				Firm, light brown (7.5YR 6/4), sandy SILT with some subangular to subrounded fine to coarse gravel sized moderately decomposed rock fragments. (COLLUVIUM)
								En	A 0.50				
								En	B 1.00				
								En	C 1.50				
			80	95					2.50	+14.66	2.50		V	Extremely weak, light brown, dappled greyish brown, completely decomposed meta-SANDSTONE. (Silty fine to coarse SAND with some angular fine to medium gravel)
								2,2,4,5,5,6 N=20	2.60 3 2.70					
								79 b/s	4 3.00					
								En	5 3.05					From 3.05m to 3.55m : With some angular fine to coarse gravel sized quartz fragments and occasional angular cobble sized quartz.
				95					6 3.50 3.55					
			80	0					7 3.90 4.00	+13.16	4.00			
			80	84	0	0		9.02×10^{-6} m/sec	T2 101				IV	From 3.90m to 4.00m : With much angular fine to coarse gravel sized quartz fragments and occasional angular cobble sized quartz.
			80	71	0	0	NA		4.50					Very weak to weak, light brown, dappled greyish brown, highly decomposed meta-SANDSTONE. (Silty fine to coarse SAND with much angular fine to coarse gravel sized quartz and rock fragments and occasional angular cobble sized quartz)
									T2 101	+12.16	5.00			
							NR	103 b/s		+11.96	5.20		V	From 5.00m to 5.20m : No recovery, inferred to be completely decomposed SANDSTONE.
	SW 5.70			0					5.20				V	Extremely weak, pinkish grey, dappled light brown, completely decomposed meta-SANDSTONE. (Silty fine SAND with occasional angular fine gravel)
	PW							261 b/s	8 5.65 5.70					
				93					9					
									10 6.15 6.20					
								4,10,12,23,28,35 N=98	11 6.30					
									12 6.60 6.65					
									13 7.70					
			80	95					14 8.70 8.80					
11/07/2011 12/07/2011		0.96m at 18:00 4.05m at 08:00						19,31/55mm 100/60mm (100/60mm)	15 8.99					
									16 9.70	+7.46	9.70			
			80						73				V	Extremely weak, light brown, dappled greyish brown, completely decomposed meta-SANDSTONE. (Silty fine to

- Disturbed sample
- Piston sample
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- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

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DATE	27/07/2011
CHECKED	E. Leung
DATE	28/07/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A constant head permeability test was carried out from 4.00m to 5.50m depth.
3. A falling head permeability test was carried out from 16.50m to 18.00m depth.
4. A standpipe was installed to 10.00m depth.
5. A water sample was taken at 10.00m depth.
6. Environmental samples were collected at 6.20m, 10.80m, 14.10m, 18.10m, 21.10m, 24.50m 29.00m, 34.80m, 38.40m, 54.50m and 61.00m.

DRILLHOLE RECORD

VIBRO	CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH13
		SHEET 2 OF 8

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 828111.84 N 841776.61	DATE : 11/07/2011 to 25/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +17.16 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW									+7.16	10.00		V	coarse SAND with some angular fine gravel)
			80	96					17 10.70 18 10.80	+6.36	10.80		III	From 10.80m to 11.14m : Moderately strong, moderately decomposed QUARTZ VEIN.
11								10,19, 28,40,32/10mm (100/160mm)	19 11.06 11.11	+6.02	11.14		V	
									11.50	+5.66	11.50			
			80	75	0	0	NA		T2|01	+5.51 +5.46	11.65 11.70		IV	Very weak to weak, brown, dappled purplish brown, highly decomposed meta-SANDSTONE. (Silty sandy angular fine to coarse GRAVEL with occasional angular cobble)
12							NR			+5.21	11.95		V	From 11.65m to 11.70m : Quartz vein.
			80	80	0	0	NA		12.10 T2|01	+5.06	12.10		IV	From 11.95m to 12.10m : No recovery, inferred to be completely decomposed meta-SANDSTONE.
							NR			+4.76	12.40		V	From 12.40m to 12.60m : No recovery, inferred to be completely decomposed meta-SANDSTONE.
			80	63	0	0	NA		12.60 T2|01	+4.56	12.60		IV	
13							NR			+4.31	12.85		V	From 12.85m to 13.00m : No recovery, inferred to be completely decomposed meta-SANDSTONE.
									20 13.00	+4.16	13.00		IV	Very weak, light brown, highly decomposed meta-SANDSTONE. (Silty fine SAND with much angular fine to coarse gravel and occasional angular cobble)
			80	92										
14								12,29, 57,43/25mm (100/100mm)	21 14.00 14.10 22 14.35					
15										+2.16	15.00			
			80	95					23 15.00					Extremely weak, light brown, dappled light grey, FAULT GOUGE. (Sandy clayey SILT with some angular to subangular fine to medium gravel)
16									24 16.00 16.10	+1.06	16.10			
								35,15/15mm 100/50mm (100/50mm)	25 16.24				V	Extremely weak to very weak, light brown, dappled brown, completely decomposed meta-SANDSTONE. (Silty fine to coarse SAND with some angular fine to coarse gravel)
								1.02×10^{-6} m/sec						
17			80	92					26 17.00					
18	12/07/2011	0.62m at 18:00							27 18.00 18.10					
	13/07/2011	3.85m at 08:00						50/65mm 100/55mm (100/55mm)	28 18.22					
19			80	0					19.00	-1.84	19.00			
			80	90	0	0	NA		29 19.10 19.20 T2|01				IV	Weak to moderately weak, light brown, dappled brown, highly decomposed meta-SANDSTONE. (Sandy angular fine to coarse GRAVEL with some angular cobble)
20			80	75	0	0			19.70 T2|01					

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- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

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DATE	28/07/2011

REMARKS

DRILLHOLE RECORD

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH13
	SHEET 3 OF 8

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 828111.84 N 841776.61	DATE : 11/07/2011 to 25/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 17.16 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-2.84	20.00			
	PW		80	75	0	0	NA		T2 101	-2.99	20.15		IV	
							NR			-3.14	20.30		V	From 20.15m to 20.30m : No recovery, inferred to be completely decomposed meta-SILTSTONE.
							NI		20.30	-3.34	20.50		III	
			80	90	0	0	NA		T2 101				IV	From 20.30m to 20.50m : Moderately strong, moderately decomposed QUARTZ VEIN.
21	PW 21.10													Very weak to weak, brown, dappled light brown, highly decomposed meta-SANDSTONE. (Silty sandy angular fine to coarse GRAVEL with some angular cobble)
	HW		80	0					30 21.10 21.20 21.30					
			80	73	0	0	NI		T2 101	-4.44	21.60		III	
							>20		21.60	-4.74	21.90			Moderately strong, greyish brown, dappled brown, moderately decomposed QUARTZITE. Fractured.
22			80	57	7	0	NR		T2 101	-5.04	22.20		V	From 21.90m to 22.20m : No recovery, inferred to be completely decomposed meta-SILTSTONE.
			80	100	63	0	14.9		22.30 T2 101				II	Strong, locally moderately strong, light grey, locally dappled light brown, slightly decomposed QUARTZITE. Joints are very closely to closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, occasional clean, dipping 10° to 20°, 20° to 30° and 30° to 40°.
23							>20		22.87					
			80	100	72	0	17.5		T2 101					
24										-6.74	23.90		III	From 23.90m to 24.30m : Moderately strong, moderately decomposed QUARTZITE.
									24.14	-7.14	24.30		II	
		0.92m at 18:00	80	89	15	0	>20		T2 101					
	13/07/2011								24.79					
25	14/07/2011	4.27m at 08:00	80	89	11	0	14.0		T2 101					
							>20		25.24					
			80	88	33	19	NI		T2 101					
							4.2							
26									25.94					
			80	93	16	0	>20		T2 101	-8.94	26.10		III	
							NA			-9.09	26.25		II	From 26.10m to 26.25m : Moderately strong, moderately decomposed QUARTZITE.
									26.39	-9.14	26.30		IV	From 26.25m to 26.30m : Quartz vein.
			80	84	30	20	10.7		T2 101	-9.26	26.42		III	Moderately strong, locally moderately weak, light brown, dappled grey, moderately decomposed meta-SILTSTONE. Joints are very closely to closely spaced, locally extremely closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, occasional clean, dipping 10° to 20°, 20° to 30° and 40° to 50°.
							NA			-9.54	26.70		IV	From 26.30m to 26.42m : Weak to moderately weak, highly decomposed SILTSTONE. (Sandy angular COBBLE with some angular fine to coarse gravel)
27									26.89	-9.69	26.85		III	From 26.70m to 26.85m : Weak to moderately weak, highly decomposed SILTSTONE. (Sandy angular COBBLE with some angular fine to coarse gravel)
			80	89	31	0	20.0		T2 101					
							NI							
			80	86	16	0	12.2		27.51 T2 101					
28							>20		28.01	-10.91	28.07			
							NA			-11.07	28.23		IV	From 28.07m to 28.23m : Weak to moderately weak, highly decomposed SILTSTONE. (Sandy angular COBBLE with some angular fine to coarse gravel)
			80	90	42	17	13.2		T2 101				III	
									28.61	-11.45	28.61		IV	From 28.61m to 28.98m : Weak to moderately weak, highly decomposed SILTSTONE. (Sandy angular COBBLE with some angular fine to coarse gravel)
		0.74m at 18:00	80	83	17	0	NA		T2 101	-11.82	28.98		III	
29	14/07/2011								29.09	-12.09	29.25		IV	From 29.25m to 29.45m : Weak to moderately weak, highly decomposed SILTSTONE. (Sandy angular COBBLE with some angular fine to coarse gravel)
	15/07/2011	3.76m at 08:00	80	88	30	0	18.5		T2 101	-12.29	29.45		III	
							NA			-12.59	29.75		IV	Weak to moderately weak, light grey, highly decomposed
							13.3		31 29.75					
30			80											

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- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

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DATE	27/07/2011
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DATE	28/07/2011

REMARKS

DRILLHOLE RECORD

VIBRO	HOLE NO. KTN-BH13
CONTRACT NO. : GE/2009/15	SHEET 4 OF 8

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 828111.84 N 841776.61	DATE : 11/07/2011 to 25/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +17.16 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-12.84	30.00			
	HW		80	85					32 30.75 30.85 33 30.91	-13.69	30.85		IV	meta-SILTSTONE. (Sandy angular COBBLE with some angular fine to coarse gravel)
31								50/30mm 100/30mm (100/30mm)					V	Extremely weak to very weak, light grey, dappled dark grey, completely decomposed meta-SILTSTONE. (Sandy SILT with much angular fine to medium gravel)
32														
33								50/30mm 100/40mm (100/40mm)	34 32.92					
										-16.34	33.50			
			75	97	54	0	11.4		33.50	-16.54	33.70		II	Moderately strong, light brown, dappled brown and light grey, moderately decomposed meta-SILTSTONE. Joints are closely spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 20° to 30° and 30° to 40°. From 33.50m to 33.70m : Strong, slightly decomposed SILTSTONE. From 34.20m to 34.60m : Weak to moderately weak, highly decomposed SILTSTONE. (Sandy angular COBBLE) Very weak, light brown, dappled dark brown, highly decomposed meta-SILTSTONE. (Sandy angular fine to coarse GRAVEL with occasional angular cobble) Moderately strong, light grey, dappled light brown, moderately decomposed meta-SILTSTONE. Fractured. From 35.50m to 35.60m : Weak to moderately weak, highly decomposed SILTSTONE. (Sandy angular fine to coarse GRAVEL) Weak to moderately weak, light brown, dappled brown, highly decomposed meta-SILTSTONE. (Sandy angular fine to coarse GRAVEL with occasional angular cobble) Very weak to weak, light brown, dappled brown, highly decomposed meta-SILTSTONE. (Sandy silty angular COBBLE with some angular fine to coarse gravel) Moderately strong, light brown, dappled light grey, moderately decomposed meta-SILTSTONE. Joints are closely spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 20° to 30°, 30° to 40° and 40° to 50°. From 36.70m to 37.30m : Strong, slightly decomposed QUARTZ VEIN with very closely spaced microfractures, dipping 70° to 80°. From 37.55m to 37.67m : With very closely spaced quartz vein 10mm thick, dipping 10° to 20°. Extremely weak, brown, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with occasional angular fine to medium gravel) Weak to moderately weak, brown, highly decomposed meta-SILTSTONE. (Sandy angular COBBLE with some angular fine to coarse gravel) Weak to moderately weak, light brown, highly decomposed meta-SILTSTONE. (Sandy angular fine to coarse GRAVEL
								T2 101		-16.54	33.70		III	
34									34.15	-17.04	34.20		IV	
		0.26m at 18:00	75	88	43	0	NA	T2 101		-17.44	34.60		III	
	15/07/2011						10.0			-17.64	34.80		IV	
	16/07/2011	4.57m at 08:00	75	100					35 34.80 36 35.10 35.20	-18.04	35.20		III	
			75	83	13	0	NI	T2 101		-18.34	35.50		IV	
							>20			-18.44	35.60		IV	
			75	92			NA		37 35.60 38 36.10 36.20	-19.04	36.20		IV	
36			75	86	10	0	NA	T2 101		-19.44	36.60		III	
							20.0			-19.54	36.70		II	
							>20		36.70					
37			75	92	18	0		T2 101		-20.14	37.30		III	
			75	87	66	18	9.5	T2 101	37.30					
										-20.69	37.85		V	
38			75	100					39 37.85 40 38.20 38.30	-21.14	38.30		IV	
		0.42m at 18:00	75	73	0	0	NA	T2 101		-21.44	38.60		IV	
	16/07/2011								41 38.60					
	18/07/2011	0.66m at 08:00												
39			75	86										
									42 39.60 43 39.70 39.75					
								50/20mm 100/30mm						
40														

Disturbed sample
Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
Water sample
En Environmental Sample

Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

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REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH13
	SHEET 5 OF 8

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 828111.84 N 841776.61	DATE : 11/07/2011 to 25/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 17.16 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW							(100/30mm)					IV	with some angular cobble) See sheet 4 of 8
								50/30mm 100/20mm (100/20mm)	44 41.75					
										-25.44	42.60			
			75	95					45 42.60 46 43.60 43.70				V	Extremely weak, light brown, dappled brown, completely decomposed meta-SILTSTONE. (SILT with occasional angular fine gravel)
								4,10, 10,8,10,10 N=38	47 43.80					
				100				320 blS	En 48 44.10 49 44.15	-26.99	44.15		V	Extremely weak, light brown, dappled brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with occasional angular fine gravel)
									50 44.45 44.50					
								9,12, 15,19,21,30 N=85	51 45.80					
									52 46.10 46.15					
18/07/2011		0.46m at 13:00												
20/07/2011		0.00m at 08:00								-30.54	47.70		V	Extremely weak, brown, dappled greyish brown, completely decomposed meta-SILTSTONE. (Sandy SILT with occasional angular fine gravel)
								8,18, 19,24,36,21/55mm (100/280mm)	53 47.78					
									54 48.08 48.13					
			75	86					55 48.60					
									56 49.60 49.70					
								8,12, 11,10,8,8 N=37	57 49.80					

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
▮ U100 undisturbed sample
▨ Mazier sample
▯ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
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REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH13
	SHEET 6 OF 8

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 828111.84 N 841776.61	DATE : 11/07/2011 to 25/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 17.16 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW							64 bls En	58 50.10 59 50.15	-32.84	50.00		V	See sheet 5 of 8
				93					50.60 60 50.65					
51									51.50	-34.34	51.50		II	Strong, dark grey, locally streaked and stripped light grey, slightly decomposed calcareous meta-SILTSTONE with closely spaced, highly deformed marble casts 10mm thick, dipping 10° to 20° and 50° to 60°. Joints are closely spaced, locally very closely spaced, rough and smooth planar, locally rough stepped, extremely narrow to very narrow, clean, dipping 10° to 20°, 20° to 30° and 40° to 50°.
52			75	100	90	53	11.3		T2 I O I 52.12					
			75	91	11	0	>20		T2 I O I	-35.49	52.65		IV	From 52.55m to 52.65m : With solution features.
							NA			-35.74	52.90		II	From 52.65m to 52.90m : Weak to moderately weak, highly decomposed SILTSTONE. (Sandy silty angular fine to coarse GRAVEL)
53							10.0		53.00					
		0.00m at 18:00	75	91	9	0	NI		T2 I O I 53.55					From 53.20m to 53.30m : With solution features.
20/07/2011														
21/07/2011		0.00m at 08:00					12.0							
54							NI							
			75	95	50	31	5.7		T2 I O I	-37.19	54.35		IV	From 54.35m to 54.55m : Weak to moderately weak, highly decomposed SILTSTONE. (Sandy silty angular fine to coarse GRAVEL)
							NA			-37.39	54.55		II	
							20.0		54.60					
55			75	93	14	0	>20		T2 I O I					
									55.30	-38.14	55.30		IV	Weak to moderately weak, dark grey, dappled grey, highly decomposed calcareous meta-SILTSTONE. (Sandy angular fine to coarse GRAVEL with some angular cobble)
			75	90					61					
56									56.30 62 56.40 63 56.47	-39.27	56.43		V	Extremely weak to very weak, grey, completely decomposed meta-SILTSTONE. (Sandy SILT with some angular fine to medium gravel)
								50/40mm 100/30mm (100/30mm)						
57														
58														
								50/20mm 100/20mm (100/20mm)	64 58.44					
59														
60														

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REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH13
	SHEET 7 OF 8

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 828111.84 N 841776.61	DATE : 11/07/2011 to 25/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 17.16 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW 60.31 NW									-42.84	60.00		V	See sheet 6 of 8
							2.4		60.31	-43.14	60.30		II	Strong, dark grey, streaked and stripped light grey, slightly decomposed calcareous meta-SILTSTONE. Joints are medium to widely spaced, rough and smooth planar, tight to extremely narrow, clean, dipping 10° to 20°. From 60.31m to 60.60m : With closely spaced, highly deformed marble casts 12mm thick, dipping 10° to 20°. From 60.73m to 60.96m : Weak to moderately weak, highly decomposed SILTSTONE. (Sandy angular fine to coarse GRAVEL with some angular cobble) From 60.90m to 60.96m : With solution features. From 61.55m to 61.75m : With closely spaced, highly deformed marble casts 12mm thick, dipping 10° to 20°. From 62.00m to 62.50m : No recovery, inferred to be Cavity infill.
										-43.57	60.73		IV	
61			75	97	78	78	NA		T2101	-43.80	60.96		II	
		0.00m at 18:00					7.1							
21/07/2011									61.47					
22/07/2011		0.00m at 08:00					2.2							
62			90	52	52	52			T2101	-44.84	62.00			
		0.00m at 18:00					NR							
22/07/2011									62.50	-45.34	62.50			
23/07/2011		0.00m at 08:00						27,23/25mm 100/70mm (100/70mm)	65 62.67				V	Extremely weak, grey, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with occasional subangular fine to medium gravel)
63														
64														
		0.00m at 18:00						6,12, 22,21,23,27 N=93	66 64.60					
23/07/2011									67 64.90 64.95					
25/07/2011		0.00m at 08:00												
66														
								6,10, 11,11,15,21 N=58						
67									68 66.95					
68														
										-51.34	68.50			
								7,11, 15,13,17,22 N=67	69 68.60				V	Extremely weak, light brown, completely decomposed meta-SILTSTONE. (Sandy SILT with occasional angular fine gravel)
69									70 68.90 68.95					
70														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	27/07/2011
CHECKED	E. Leung
DATE	28/07/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH13
	SHEET 8 OF 8

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 828111.84 N 841776.61	DATE : 11/07/2011 to 25/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 17.16 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
25/07/2011	NW NW 70.95	0.00m at 18:00						8,11, 13,16,16,23 N=68	71 70.60 72 70.90 70.95	-52.84 -53.79	70.00 70.95		V	See sheet 7 of 8 End of Investigation Hole at 70.95m.

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	27/07/2011
CHECKED	E. Leung
DATE	28/07/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH14
	SHEET 1 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study -- Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828256.58 N 842062.80	DATE : 11/02/2011 to 04/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +18.01 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type	Depth	Reduced Level	Depth (m)	Legend	Grade	Description
11/02/2011	SW									0.00	+18.01	0.00			Firm, brown (7.5YR 5/4), slightly sandy SILT with occasional angular fine gravel sized asphalt fragments. (FILL)
								En	A INSPECTION PIT	0.50	+17.51	0.50		VI	Firm, brown, slightly sandy SILT. (RESIDUAL SOIL)
								En	B INSPECTION PIT	1.00					
11/02/2011								En	C INSPECTION PIT	1.50	+16.51	1.50		V	Extremely weak, reddish brown, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
12/02/2011			60	87					1						
									2	2.50 2.60	+15.41	2.60		V	Extremely weak, light brown, dappled brown, completely decomposed meta-SANDSTONE. (Silty fine SAND)
	SW 3.00							1,2, 2,2,2,2 N=8	3	2.70					
	PW								4	3.00					
				100				45 b/s	En 5	3.05					
									6	3.30					
			60	95					7	3.55					
									8	4.55 4.65					
								3,6, 7,8,12,14 N=41	9	4.75					
									10	5.05 5.10					
								1.16×10^{-6} m/sec							
									11	5.55	+12.46	5.55		V	Extremely weak, purplish grey, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
			60	95											
		2.05m at 18:00						3,6, 8,8,9,9 N=34	12	6.55 6.65					
12/02/2011									13	6.75					
19/02/2011		3.10m at 06:00						152 b/s	14	7.05	+10.91	7.10			
				100					En 15	7.10				V	Extremely weak, light brown, dappled brown, streaked light grey and dark grey, completely decomposed meta-SANDSTONE with iron and manganese stained, kaolin coated relict joints. (Silty fine SAND)
									16	7.55					
			60	100					17	7.60					
									18	8.60 8.70					
								5,6, 6,8,10,12 N=36	19	8.80					
									20	9.10 9.15					
											+8.41	9.60			
			60						21	9.60				V	Extremely weak, purplish grey, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	14/03/2011
CHECKED	E. Leung
DATE	15/03/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. Falling head permeability tests were carried out from 5.10m to 6.60m and 18.50m to 20.00m depth.
3. An acoustic televiewer survey was carried out from 57.50m to 62.30m depth.
4. Piezometers were installed at 6.50m and 57.00m depth.

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH14

CONTRACT NO. GE/2009/15

SHEET 2 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828256.58 N 842062.80	DATE : 11/02/2011 to 04/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 18.01 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW			85						+8.01	10.00		V	SILT) See sheet 1 of 7
			60						22 10.60 10.70					
		2.80m at 18:00						4,5, 6,6,8,13 N=33	23 10.80					
11									24 11.10					
19/02/2011									En 25 11.15					
21/02/2011		6.60m at 08:00		100				47 blo	26 11.60	+6.36	11.65			
									27 11.65				V	Extremely weak, light brown, dappled brown, streaked light grey, completely decomposed meta-SILTSTONE with some kaolin infilled relict joints (1mm to 2mm) dipping subvertically. (Slightly sandy SILT)
12			60	100										
									28 12.65 12.75					
13								4,6, 6,6,7,9 N=28	29 12.85					
									30 13.15 13.20					
									31 13.65					
14			60	100										
									32 14.65 14.75					
								5,5, 8,11,12,12 N=43	33 14.85					
15									34 15.15 15.20					
		2.60m at 18:00		100				72 blo	En 35					
21/02/2011									36 15.65	+2.31	15.70			
22/02/2011		6.60m at 08:00							37 15.70				V	Extremely weak, grey, completely decomposed meta-SILTSTONE. (SILT)
16			60	100										
									38 16.70 16.80					
17								5,6, 10,12,22,33 N=77	39 16.90					
									40 17.20 17.25					
									41 17.70					
18			60	10										
	PW 18.80							9.25 x 10^{-7} m/sec	42 18.70 18.80					
19	HW								43					
			60	90										
									44 19.80 19.90	-1.89	19.90			From 19.80m to 19.90m : With iron and manganese stained joints.
20		3.20m						30.20/65mm	45					

Disturbed sample	Standard penetration test
Piston sample	In-situ vane shear test
U76 undisturbed sample	Permeability test
U100 undisturbed sample	Pressuremeter test
Mazier sample	Packer Test
SPT liner sample	Acoustic or optical televiewer survey
Water sample	Piezometer tip
En Environmental Sample	Standpipe

LOGGED	T. C. Yip
DATE	14/03/2011
CHECKED	E. Leung
DATE	15/03/2011

REMARKS

J200946e_22

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH14

CONTRACT NO. GE/2009/15

SHEET 3 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES		W.O.NO.	GE/2009/15.22
MACHINE & NO.	VBM49	E 828256.58	N 842062.80	DATE :	11/02/2011 to 04/03/2011
FLUSHING MEDIUM	Water	ORIENTATION	Vertical	GROUND LEVEL	+ 18.01 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	Fi	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW	at 18:00 7.80m at 08:00						35,41,24/20mm (100/170mm)	46 20.16 20.21	-1.99	20.00		V	Extremely weak to very weak, grey, completely decomposed meta-SILTSTONE. (SILT)
22/02/2011 24/02/2011			60	86					47 20.80					
21									48 21.80 21.90					
22								9,13, 15,24,30,31/65mm (100/290mm)	49 21.99 50 22.29 22.34					
			60	100					51 22.80					
23									52 23.80 23.90	-5.89	23.90			
24		5.10m at 18:00						6,9, 12,18,20,38 N=88	53 24.00 54 24.30 24.35				V	Extremely weak, grey, completely decomposed meta-SILTSTONE. (SILT)
24/02/2011 25/02/2011		7.90m at 08:00							55 24.80					
25			60	90					56 25.80 25.90					
26								14,16, 20,23,57/70mm (100/220mm)	57 25.92 58 26.22 26.27					
27									59 26.80					
			60	58					60 27.80 27.90					
28									61					
			60	100					62 28.90 29.00	-10.99	29.00			
29		4.30m at 18:00						13,18, 26,42,32/30mm (100/180mm)	63 64 29.28 29.33				V	Extremely weak to very weak, grey, dappled light brown, completely decomposed meta-SILTSTONE. (SILT with occasional angular fine gravel)
25/02/2011 26/02/2011		7.88m at 08:00												
30									65 29.90					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

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DATE	14/03/2011
CHECKED	E. Leung
DATE	15/03/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH14
	SHEET 4 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828256.58 N 842062.80	DATE : 11/02/2011 to 04/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +18.01 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW		60	100						-11.99	30.00		V	See sheet 3 of 7
31								16,21, 28,39,33/40mm (100/190mm)	66 30.90 31.00 67 68 31.29 31.34					
										-13.89	31.90		IV	Very weak to weak, locally moderately weak, grey, dappled brown, highly decomposed meta-SILTSTONE. (Recovered as silty sandy angular fine to coarse GRAVEL with occasional angular cobble)
32			60	100					69 31.90					
33								25,25/65mm 60,40/25mm (100/100mm)	70 32.90 33.00 71 72 33.19 33.24					
34			60	100					73 33.90					
35								50/30mm 100/70mm (100/70mm)	74 34.90 35.00 75 35.10					
36			60	0					35.90					
									76 36.30 36.40	-18.39	36.40		IV	Weak to moderately weak, grey, dappled light brown and brown, highly decomposed meta-SILTSTONE. Joints are very closely to closely spaced, occasional medium spaced, rough and smooth planar, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20° and 20° to 30°.
37			60	97	29	16	>20 17.1 >20 6.0	T2101		-19.29	37.30		III	From 37.30m to 37.80m : Moderately strong, moderately decomposed meta-SILTSTONE.
									37.80	-19.79	37.80		IV	
38			60	96	4	0	>20 NI >20	T2101						
39	26/02/2011	5.90m at 18:00					NA			-20.94	38.95		V	From 38.95m to 39.10m : Extremely weak to very weak, grey, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
	28/02/2011	7.78m at 08:00							77 39.10	-21.09	39.10		V	Extremely weak to very weak, grey, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with some angular fine gravel)
40			60	81										

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	14/03/2011
CHECKED	E. Leung
DATE	15/03/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH14
	SHEET 5 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study -- Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828256.58 N 842062.80	DATE : 11/02/2011 to 04/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +18.01 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW									-21.99	40.00			
41								39,11/15mm 100/70mm (100/70mm)	78 40.10 40.20 79 40.36				V	See sheet 4 of 7
			60	88					80 41.10	-23.09	41.10		IV	Very weak to weak, locally moderately weak, grey, dappled light brown, highly decomposed meta-SILTSTONE. (Recovered as silty sandy angular fine to coarse GRAVEL with occasional angular cobble)
42									81 42.10 42.20 82 42.31					
43								50/40mm 100/70mm (100/70mm)						
			60	0					43.10					
									83 43.50 43.60	-25.59	43.60		III	Moderately strong, locally moderately weak, grey, dappled light brown, moderately decomposed meta-SILTSTONE. Joints are very closely to closely spaced, rough and smooth planar, extremely narrow, iron and manganese stained, dipping 20° to 30°, 30° to 40° and occasional 50° 60°.
44			60	85	0	0	>20		T2101	-26.29	44.30		V	From 44.30m to 44.45m : Extremely weak, grey, completely decomposed meta-SILTSTONE. (SILT)
							NA			-26.44	44.45			From 44.45m to 44.60m : No recovery, inferred to be completely decomposed meta-SILTSTONE.
							NR			-26.59	44.60			
			60	88					84 44.60				IV	Very weak to weak, grey, dappled greyish brown, highly decomposed meta-SILTSTONE. (Sandy silty angular fine to coarse GRAVEL with occasional angular cobble)
45		3.20m at 18:00							T2101					
	28/02/2011	7.80m at 08:00							85 45.60 45.70 86 45.76					
46	01/03/2011							50/35mm 100/25mm (100/25mm)						
	HW 46.50								46.50	-28.49	46.50		IV	Weak to moderately weak, greyish brown, dappled light brown, highly decomposed meta-SILTSTONE. Joints are closely spaced, locally very closely and medium spaced, rough and smooth planar, extremely narrow, iron and manganese stained, dipping 0° to 10°, 10° to 20°, 50° to 60° and occasional 60° to 70°.
			60	95	7	0	>20		T2101					
47							NI							
			60	100	51	34	20.0		47.20					
							6.0		T2101					
48							15.0		47.85					
			60	98	67	49	NA		T2101	-30.34	48.35		V	From 48.35m to 48.75m : Extremely weak, grey, completely decomposed meta-SILTSTONE. (SILT)
										-30.74	48.75		IV	
49							5.0			-30.89	48.90		III	From 48.90m to 49.50m : Moderately strong, moderately decomposed meta-SILTSTONE.
									49.35					
			60	93	34	20	16.0		T2101	-31.49	49.50		IV	
50							NI							

Disturbed sample	Standard penetration test
Piston sample	In-situ vane shear test
U76 undisturbed sample	Permeability test
U100 undisturbed sample	Pressuremeter test
Mazier sample	Packer Test
SPT liner sample	Acoustic or optical televiewer survey
Water sample	Piezometer tip
En Environmental Sample	Standpipe

LOGGED	T. C. Yip
DATE	14/03/2011
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DATE	15/03/2011

REMARKS

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH14

CONTRACT NO. GE/2009/15

SHEET 6 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828256.58 N 842062.80	DATE : 11/02/2011 to 04/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +18.01 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-31.99	50.00			
		5.60m at 18:00	60	93	34	20	4.0		T2101 50.35				IV	See sheet 5 of 7
01/03/2011							20.0			-32.39	50.40			
02/03/2011		13.20m at 06:00					NA			-32.59	50.60		V	From 50.40m to 50.60m : Extremely weak, grey, completely decomposed meta-SILTSTONE. (SILT)
										-32.79	50.80		IV	
51			45	98	29	14	16.0		T2101				III	From 50.80m to 51.40m : Moderately strong, moderately decomposed meta-SILTSTONE.
										-33.39	51.40			
										-33.59	51.60		IV	
							10.0			-33.74	51.75		III	From 51.60m to 51.75m : Moderately strong, moderately decomposed meta-SILTSTONE.
52							NI		51.83	-34.04	52.05		IV	
			45	98	33	0			T2101				III	Moderately strong, locally moderately weak, grey, locally dappled greyish brown, moderately decomposed meta-SILTSTONE with quartz and rock fragments. Joints are closely spaced, locally very closely and occasional medium spaced, rough and smooth planar, occasional rough stepped, extremely narrow, iron and manganese stained, locally clean, dipping 10° to 20°, 20° to 30°, 40° to 50° and occasional 0° to 10°.
							16.7		52.70					
53			45	100	79	34			T2101					
							6.1							
54							>20		54.01					
			45	100	84	65	7.7		T2101	-36.24	54.25		III	From 54.25m to 54.45m : Weak to moderately weak, moderately decomposed meta-SILTSTONE.
							>20		54.58					
55			45	100	73	27			T2101	-36.94	54.95		IV	From 54.95m to 55.15m : Weak to moderately weak, highly decomposed meta-SILTSTONE.
										-37.14	55.15		III	
									55.35	-37.34	55.35		IV	From 55.35m to 55.50m : Weak to moderately weak, highly decomposed meta-SILTSTONE.
										-37.49	55.50		III	
							13.8			-37.69	55.70		IV	From 55.70m to 56.00m : Weak to moderately weak, highly decomposed meta-SILTSTONE.
56			45	99	61	15			T2101	-37.99	56.00		III	
										-38.29	56.30		IV	From 56.30m to 56.82m : Weak to moderately weak, highly decomposed meta-SILTSTONE.
									56.82	-38.81	56.82		III	
57							NI			-38.94	56.95		IV	Moderately strong, light brown, dappled light grey, moderately decomposed meta-SILTSTONE. Joints are closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 0° to 10°, 10° to 20° and 20° to 30°.
		12.90m at 18:00	45	93	32	0	14.3		T2101	-39.14	57.15		III	From 56.95m to 57.15m : Weak to moderately weak, highly decomposed meta-SILTSTONE.
02/03/2011														
03/03/2011		13.20m at 06:00					5.9		57.50					
							17.7			-39.84	57.85		II	Strong, dark grey, dappled light grey and light brown, slightly decomposed meta-SILTSTONE with some quartz and rock fragments sized up to 100mm. Joints are closely spaced, locally very closely and medium spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, epidote coated, dipping 10° to 20°, 20° to 30°, 50° to 60° and occasional 60° to 70°.
58			45	99	87	46			T2101					
							3.2							
							18.8		59.00					
59			45	100	83	37	4.9		T2101					From 59.55m to 60.20m : Subvertical joint.
							12.3							
60														

↕ Disturbed sample
■ Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED T. C. Yip
DATE 14/03/2011
CHECKED E. Leung
DATE 15/03/2011

REMARKS

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH14

CONTRACT NO. GE/2009/15

SHEET 7 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828256.58 N 842062.80	DATE : 11/02/2011 to 04/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +18.01 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
			45	100	83	37			T2 01 60.15	-41.99	60.00		II	See sheet 6 of 7
			45	100	84	35	12.3		T2 01 61.37					From 60.83m to 61.20m : Subvertical joint.
							6.7			-43.59	61.60		III	
			45	100	53	38	>20		T2 01	-43.89	61.90			From 61.60m to 61.90m : Moderately strong, moderately decomposed meta-SILTSTONE with quartz and rock fragments and subvertical joint.
		13.10m at 18:00											II	
03/03/2011									62.24	-44.39	62.40			From 62.40m to 62.60m : Moderately strong, moderately decomposed meta-SILTSTONE with quartz and rock fragments.
04/03/2011		13.20m at 08:00	45	100	42	0	14.7		T2 01 62.60	-44.59	62.60		III	
04/03/2011		13.20m at 12:00												End of Investigation Hole at 62.60m.

61 62 63 64 65 66 67 68 69 70

Disturbed sample
Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
Water sample
En Environmental Sample

Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	14/03/2011
CHECKED	E. Leung
DATE	15/03/2011

REMARKS

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH15

CONTRACT NO. GE/2009/15

SHEET 1 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM41	E 827932.14 N 841537.48	DATE : 25/03/2011 to 29/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +25.91 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush % Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
25/03/2011	PW								+25.91	0.00				Concrete surface.
									+25.81	0.10				Firm, brown (7.5YR 5/4), sandy SILT with some subangular to subrounded fine to coarse gravel sized moderately decomposed rock fragments and occasional subrounded cobble sized moderately decomposed Siltstone. (COLLUVIUM)
									En A 0.60					
									En B 1.10					
									En C 1.60	+24.31	1.60			
			60	95					1 2.60					Firm, reddish brown (2.5YR 5/4), slightly sandy SILT with occasional subangular to subrounded fine gravel sized highly decomposed rock fragments. (COLLUVIUM)
									2 2.70	+23.21	2.70			
								3,4, 4,6,7,8 N=25 52 blows	3 2.80				V	Extremely weak, light brown, dappled brown and reddish brown, completely decomposed meta-SILTSTONE. (SILT)
				85					4 3.10					
									En 5 3.15					
									6 3.60					
			60	95					7 3.65					
									8 4.65 4.75					
		Dry at 18:00						4,8, 8,8,9,8 N=33	9 4.85					
25/03/2011									10 5.15 5.20					
26/03/2011		Dry at 08:00												
								6.89 x 10^{-7} m/sec	11 5.65					
			60	100					12 6.65 6.75					
									13 6.85					
26/03/2011		Dry at 18:00						6,6, 12,12,12,13 N=49 117 blows	14 7.15	+18.71	7.20			
28/03/2011		5.50m at 08:00		76					En 15 7.20				V	Extremely weak to very weak, reddish brown, dappled light brown and brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with some angular fine to coarse gravel)
									16 7.65					
			60	56					17 7.70					
									18 8.70 8.80	+17.11	8.80		IV	Weak to moderately weak, light brown, dappled brown, highly decomposed meta-SILTSTONE. (Recovered as angular to subangular medium to coarse GRAVEL with occasional subangular cobble and quartz fragments)
			60	0										
									19 9.50 9.60	+16.31	9.60			
			60	100	80	28	>20		T2 10				IV	Weak, reddish brown, dappled light brown and brown, highly decomposed meta-SILTSTONE.
							20.0							

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED T. C. Yip

DATE 12/04/2011

CHECKED E. Leung

DATE 13/04/2011

REMARKS

1. An inspection pit was excavated to 1.60m depth.
2. A falling head permeability test was carried out from 5.70m to 7.20m depth.
3. An acoustic televiewer survey was carried out from 16.32m to 21.65m depth.
4. A piezometer was installed at 14.00m depth.

J2009466_22

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH15

CONTRACT NO. GE/2009/15

SHEET 2 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM41	E 827932.14 N 841537.48	DATE : 25/03/2011 to 29/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +25.91 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW		60	100	80	28	20.0		T2 10.50	+15.91	10.00		IV	Joints are very closely to closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 20° to 30°, 30° to 40° and occasional 40° to 50°. From 10.50m to 10.60m : Moderately weak to moderately strong.
			60	80	6	0	NI >20 NR		T2	+15.01	10.90			
11										+14.91	11.00		V	From 10.90m to 11.00m : No recovery, inferred to be completely decomposed SILTSTONE.
			60	0					11.00				IV	Weak to moderately weak, greyish brown, dappled brown, highly decomposed meta-SILTSTONE. (Recovered as sandy angular fine to coarse GRAVEL)
12									20 11.90 12.00	+13.91	12.00			
			60	83	0	0	NI		T2 12.30				IV	Weak to moderately weak, light brown, dappled greyish brown, highly decomposed meta-SILTSTONE. (Recovered as angular fine to coarse GRAVEL with some angular to subangular cobble)
			60	0					12.60					
									21 12.70	+13.21	12.70			
13			60	80	48	0	>20 NR		T2	+12.91	13.00		III	Moderately strong, locally moderately weak, brown, moderately decomposed meta-SILTSTONE.
										+12.81	13.10		IV	Joints are closely spaced, rough planar, extremely narrow, iron and manganese stained, dipping 0° to 10° and 10° to 20°.
										+12.71	13.20		V	From 13.00m to 13.10m : Weak, highly decomposed SILTSTONE.
14			60	90					22 13.20				V	From 13.10m to 13.20m : No recovery, inferred to be completely decomposed SILTSTONE.
									23 14.20 14.30					Extremely weak to very weak, light brown, dappled brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with some angular to subangular fine to medium gravel)
28/03/2011	PW 14.50	5.30m at 18:00						38,12/5mm 100/50mm (100/50mm)	24 14.50	+11.41	14.50			
29/03/2011	HW	7.80m at 08:00	60	83	60	60	8.3		T2 14.80				III	Moderately strong, light brown, dappled greyish brown, moderately decomposed meta-SILTSTONE.
15			60	63	26	0	>20 NR		T2	+10.71	15.20		IV	Joints are closely spaced, locally very closely spaced, rough and smooth planar, extremely narrow, iron and manganese stained, dipping 0° to 10° and 10° to 20°.
	HW 15.60									+10.61	15.30		V	From 15.20m to 15.30m : Weak to moderately weak, highly decomposed SILTSTONE.
									15.60	+10.31	15.60			From 15.30m to 15.60m : No recovery, inferred to be completely decomposed SILTSTONE.
16			60	85	10	0	>20		T2 16.00				III	Strong, grey, dappled light grey and dark grey, slightly decomposed meta-SILTSTONE.
			60	94	15	0			T2 16.46	+9.71	16.20		II	Joints are closely spaced, locally very closely spaced, occasional medium spaced, rough and smooth planar, occasional rough undulating, extremely narrow, iron and manganese stained, dipping 10° to 20°, 20° to 30°, 30° to 40° and occasional 50° to 60°.
			60	100	100	29	7.0			+8.95	16.96			From 15.60m to 16.20m : Moderately strong, moderately decomposed SILTSTONE.
17							15.8			+8.91	17.00			From 16.96m to 17.00m : Quartz vein (40mm), dipping 0° to 10°.
							>20		T2 17.57					From 17.57m to 18.44m : With closely to medium spaced quartz veins (10mm to 30mm), dipping 0° to 10° and 20° to 30°.
18			60	100	68	27	6.6							
							17.9			+7.41	18.50			
										+7.16	18.75		III	From 18.50m to 18.75m : Moderately strong, moderately decomposed SILTSTONE.
									18.83	+7.03	18.83		II	From 18.83m to 18.93m : Moderately strong, moderately decomposed SILTSTONE.
19							NI			+6.98	18.93		III	
			60	98	83	28	14.1		T2 19.71				II	
										+6.20	19.71			
20			60	100	100	83	7.1		T2				II	Strong, grey, dappled dark grey, slightly decomposed meta-SILTSTONE.

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	12/04/2011
CHECKED	E. Leung
DATE	13/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH15
	SHEET 3 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM41	E 827932.14 N 841537.48	DATE : 25/03/2011 to 29/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 25.91 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
			60	100	100	83	7.1		T2101 20.41	+5.91	20.00		II	Joints are medium spaced, locally closely spaced, rough and smooth planar, extremely narrow, clean and occasional iron stained, dipping 0° to 10° and 10° to 20°.
			60	100	100	95	2.4		T2101 21.93	+4.31	21.60			
29/03/2011		6.10m at 18:00								+4.28	21.63			From 21.60m to 21.63m : Quartz vein (20mm), dipping 0° to 10°.
										+3.98	21.93			End of Investigation Hole at 21.93m.

21 22 23 24 25 26 27 28 29 30

Disturbed sample	Standard penetration test
Piston sample	In-situ vane shear test
U76 undisturbed sample	Permeability test
U100 undisturbed sample	Pressuremeter test
Mazier sample	Packer Test
SPT liner sample	Acoustic or optical televiewer survey
Water sample	Piezometer tip
En Environmental Sample	Standpipe

LOGGED	T. C. Yip
DATE	12/04/2011
CHECKED	E. Leung
DATE	13/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH16
	SHEET 1 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828020.92 N 841704.81	DATE : 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 19.78 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
28/03/2011	SW									+19.78	0.00			Firm, light brown (7.5YR 6/4), dappled brown, sandy SILT with occasional angular to subangular fine gravel sized highly decomposed rock fragments. (COLLUVIUM)
								En	A INSPECTION PIT 0.50				
								En	B 1.00	+18.78	1.00		V	Extremely weak, brown, dappled reddish brown and light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
28/03/2011								En	C 1 1.50					
29/03/2011			80	48					2 3 2.50 2.60					From 2.50m to 2.60m : With occasional angular medium to coarse gravel sized quartz.
			80	93					4 3.60 3.70					
								2,2, 4,13,15,19 N=51	5 3.80					
				84				188 blows En	6 7 4.10 4.15					
								1.05×10^{-6} m/sec	8 4.60 4.65	+15.13	4.65		V	Extremely weak, light brown, dappled light grey, completely decomposed meta-SANDSTONE. (Silty fine SAND with some angular to subangular fine to medium quartz gravel)
	SW 5.05		80	0					9 4.95 5.05	+14.73	5.05		IV	
	PW	0.70m at 18:00					>20			+14.48	5.30		III	Moderately strong, locally moderately weak, light brown, dappled brown and greyish brown, moderately decomposed meta-SANDSTONE. Joints are closely spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20°, 20° to 30° and 40° to 50°. From 5.05m to 5.30m : Weak to moderately weak, highly decomposed SANDSTONE. From 5.70m to 5.84m : With closely spaced, quartz veins 2mm to 5mm thick, dipping 30° to 40°.
29/03/2011									T2101					
30/03/2011		2.80m at 08:00	80	97	83	66	5.8							
30/03/2011		0.60m at 12:00							6.00					
31/03/2011		Dry at 08:00	80	98	31	0	>20		T2101					
							11.1		6.65					
							>20			+12.78	7.00			
			80	95	66	51	5.8		T2101				III	Moderately strong, greyish white, locally dappled light brown, moderately decomposed meta-SILTSTONE. Joints are closely to medium spaced, locally very closely spaced, rough and smooth planar, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20°, 20° to 30°, 30° to 40° and occasional 50° to 60°.
										+11.73	8.05			
							>20		8.12	+11.48	8.30		IV	From 8.05m to 8.30m : Weak to moderately weak, highly decomposed SILTSTONE.
			80	59	35	0	NR		T2101	+11.08	8.70		V	From 8.30m to 8.70m : No recovery, inferred to be completely decomposed SILTSTONE.
							13.3						III	
			80	98	82	79	4.6		9.10 T2101 9.95					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	14/04/2011
CHECKED	E. Leung
DATE	15/04/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A falling head permeability test was carried out from 3.50m to 5.00m depth.
3. A piezometer was installed at 51.20m depth.

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH16

CONTRACT NO. GE/2009/15

SHEET 2 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828020.92 N 841704.81	DATE : 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 19.78 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW									+9.78	10.00			
										+9.68	10.10		IV	From 10.10m to 10.20m : Weak to moderately weak, highly decomposed SILTSTONE.
										+9.58	10.20		III	
			80	100	15	0	>20		T2101	+9.48	10.30		IV	From 10.30m to 10.50m : Weak to moderately weak, highly decomposed SILTSTONE.
										+9.28	10.50		III	
										+9.18	10.60		IV	Weak to moderately weak, light grey, dappled light brown, highly decomposed meta-SILTSTONE. (Recovered as sandy angular fine to coarse GRAVEL with occasional angular cobble)
11			80	0					10.60					
									10 11.40 11.50					
							NI			+7.93	11.85		V	From 11.85m to 12.10m : Extremely weak, greyish white, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
12			80	95	24	12	NA		T2101	+7.68	12.10		III	Moderately strong to strong, greyish white, locally dappled light brown, moderately decomposed QUARTZITE. Joints are very closely to closely spaced, locally medium spaced, rough planar and rough stepped, extremely narrow, iron and locally manganese stained, dipping 10° to 20°, 20° to 30°, occasional 50° to 60° and 60° to 70°. From 12.50m to 12.80m : Meta-SILTSTONE.
		3.90m at 18:00					7.5							
	31/03/2011									+7.28	12.50			
	01/04/2011	7.40m at 08:00					>20		12.50	+6.98	12.80			
13							16.0							
			80	99	60	39	2.5		T2101					
							12.7		13.80					
14							>20							
							3.3							
			80	95	39	17	>20		T2101					
15														
									11 15.25	+4.53	15.25		IV	Weak to moderately weak, light grey, highly decomposed QUARTZITE. (Recovered as sandy angular fine to coarse GRAVEL)
			80	30					12 16.25 16.35	+3.43	16.35		IV	Weak to moderately weak, brown, dappled light brown and greyish brown, highly decomposed meta-SILTSTONE. (Recovered as silty angular fine to coarse GRAVEL with some angular cobble)
16									13					
			80	70										
17		4.90m at 18:00							14 17.35 17.45					
	01/04/2011							*50/10mm 100/20mm (100/20mm)	15 17.48					
	02/04/2011	6.10m at 08:00												
18									16 18.35					
			80	50										
19									17 19.35 19.45					
			80	0					18 19.80 19.90 T2101	-0.12	19.90			
20														

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
■ U100 undisturbed sample
▨ Mazier sample
□ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	14/04/2011
CHECKED	E. Leung
DATE	15/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH16
	SHEET 3 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828020.92 N 841704.81	DATE : 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 19.78 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR%	SCR%	RQD%	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW		80	97	26	0	>20		T2 20.00	-0.22	20.00		III	Moderately strong, locally moderately weak, light brown, dappled pinkish grey, moderately decomposed meta-SILTSTONE. Joints are very closely spaced, locally closely spaced, rough and smooth planar, occasional rough stepped, iron and occasional manganese stained, dipping 10° to 20°, 20° to 30° and 30° to 40°.
							16.7		20.36					
			80	97	17	0	>20		T2 20.94					
21			80	100	25	0	14.3		T2 21.14	-1.36	21.14		IV	Very weak to weak, locally moderately weak, brown, dappled light brown, highly decomposed meta-SILTSTONE. (Recovered as silty angular COBBLE with some angular fine to coarse gravel)
			80	90					19					
22								50/10mm 100/30mm (100/30mm)	20 22.14 21 22.24 22.28					
23			80	90					22 23.14					
24		4.30m at 18:00							23 24.14 24 24.24 24.28					
	02/04/2011 04/04/2011	6.50m at 08:00						50/10mm 100/30mm (100/30mm)						
25			80	0					25 25.14 25.19 25.24	-5.46	25.24		III	Moderately strong, light brown dappled brown, moderately decomposed meta-SILTSTONE. Joints are very closely spaced, locally closely spaced, rough planar, very narrow, iron stained, dipping 20° to 30° and 30° to 40°.
			80	97	11	0	>20		T2 25.70	-5.92	25.70		IV	Weak to moderately weak, brown, dappled light brown, highly decomposed meta-SILTSTONE. (Recovered as silty angular COBBLE with some angular fine to coarse gravel)
26			80	0					26 26.70 26.80					
			80	0					26.90 27 27.00					From 26.90m to 27.00m : With some angular to subangular fine to medium gravel. sized quartz.
27			80	80	10	0	>20		T2	-7.52	27.30		V	From 27.30m to 27.50m : No recovery, inferred to be completely decomposed SILTSTONE.
							NR			-7.72	27.50		V	Extremely weak to very weak, brown, dappled light brown, completely decomposed meta-SILTSTONE. (SILT with some angular fine to coarse gravel)
28			80	60					28 27.50					
	PW 28.50								29 28.50 30 28.60	-8.82	28.60		IV	Very weak to weak, light brown, dappled brown, highly decomposed meta-SANDSTONE. (Recovered as silty angular fine to coarse GRAVEL with occasional angular cobble)
29	HW		80	90										
									31 29.60 32 29.70 29.75					
30								50/10mm 100/40mm (100/40mm)						

Disturbed sample	Standard penetration test	LOGGED	T. C. Yip
Piston sample	In-situ vane shear test	DATE	14/04/2011
U76 undisturbed sample	Permeability test	CHECKED	E. Leung
U100 undisturbed sample	Pressuremeter test	DATE	15/04/2011
Mazier sample	Packer Test		
SPT liner sample	Acoustic or optical televiewer survey		
Water sample	Piezometer tip		
En Environmental Sample	Standpipe		

REMARKS

DRILLHOLE RECORD

HOLE NO. KTN-BH16

CONTRACT NO. GE/2009/15

SHEET 4 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828020.92 N 841704.81	DATE : 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +19.78 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW									-10.22	30.00		IV	See sheet 3 of 6
									33 30.60	-10.82	30.60		V	Extremely weak to very weak, brown, completely decomposed meta-SANDSTONE. (Silty fine SAND)
		4.50m at 18:00	80	90										
04/04/2011									34 31.60					
06/04/2011		6.50m at 08:00						50/20mm 100/60mm (100/60mm)	35 31.78	-11.92	31.70		V	Extremely weak, light brown, dappled brown, completely decomposed meta-SILTSTONE. (SILT)
									36 32.60					
			80	100										
									37 33.60					
								50/30mm 100/70mm (100/70mm)	38 33.80					
									39 34.60					
			80	90										
									40 35.60					
								31,19/55mm 100/40mm (100/40mm)	41 35.87					
										-16.82	36.60			
									42 36.60				V	Extremely weak, brown, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with occasional angular fine quartz gravel)
			80	85										
		4.10m at 18:00							43 37.60					
05/04/2011														
07/04/2011		6.50m at 08:00						6,8, 15,22,30,29 N=96	44 37.80					
									45 38.10					
									46 38.60					
			80	100										
									47 39.60					
								5,7, 18,21,26,35 N=100	48 39.80					

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
▮ U100 undisturbed sample
▨ Mazier sample
▯ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED T. C. Yip
DATE 14/04/2011
CHECKED E. Leung
DATE 15/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH16
	SHEET 5 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828020.92 N 841704.81	DATE : 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 19.78 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR%	SCR%	RQD%	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW								40.10 40.15	-20.22	40.00		V	See sheet 4 of 6
									49 40.60	-20.82	40.60			
41			80	95					50 41.60					Extremely weak, brown, dappled grey and light brown, FAULT GOUGE. (Slightly sandy SILT)
									51 41.70	-21.92	41.70			
42								37,13/25mm 100/50mm (100/50mm)	52 41.85				V	Extremely weak, brown, dappled grey, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
43			80	100					53 42.60					
		5.10m at 18:00							54 43.60					
	07/04/2011								43.70					
44	08/04/2011	6.50m at 08:00						50/30mm 100/70mm (100/70mm)	55 43.80					
									56 44.60					
45			80	100					45.60					
									57 45.70	-25.92	45.70			
								50/10mm 100/40mm (100/40mm)	58 45.75				V	Extremely weak to very weak, brown, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with some angular fine to medium gravel)
46										-26.82	46.60			
									59 46.60				V	Extremely weak, brown, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
47			80	95						-27.82	47.60			
									60 47.60 47.70	-27.92	47.70			From 47.60m to 47.70m : FAULT GOUGE 20mm thick, dipping 45°. (Sandy SILT with occasional angular fine gravel)
								50/30mm 100/70mm (100/70mm)	61 47.80					
48														
									62 48.60					
49			80	100										
									63 49.60 64 49.70 49.75					
50								50/10mm 100/40mm (100/40mm)						

- ↕ Disturbed sample
- ■ Piston sample
- ▒ U76 undisturbed sample
- ■ U100 undisturbed sample
- ▨ Mazier sample
- ▯ SPT liner sample
- ▲ Water sample
- En Environmental Sample
- ↓ Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	14/04/2011
CHECKED	E. Leung
DATE	15/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH16
	SHEET 6 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828020.92 N 841704.81	DATE : 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 19.78 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW									-30.22	50.00		V	See sheet 5 of 6
									65 50.60	-30.82	50.60		IV	Weak to moderately weak, locally moderately strong, grey, dappled brown, highly decomposed meta-SILTSTONE. (Silty angular COBBLE with some angular fine to coarse gravel)
08/04/2011	HW 51.74	5.10m at 18:00	80	100				50/10mm 100/30mm (100/30mm)	60 51.60 67 51.70 51.74	-31.96	51.74			End of Investigation Hole at 51.74m.

Disturbed sample	Standard penetration test
Piston sample	In-situ vane shear test
U76 undisturbed sample	Permeability test
U100 undisturbed sample	Pressuremeter test
Mazier sample	Packer Test
SPT liner sample	Acoustic or optical televiewer survey
Water sample	Piezometer tip
En Environmental Sample	Standpipe

LOGGED	T. C. Yip
DATE	14/04/2011
CHECKED	E. Leung
DATE	15/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH17

CONTRACT NO. GE/2009/15

SHEET 1 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828231.70 N 841911.86	DATE : 11/02/2011 to 23/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +16.29 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
11/02/2011	SW									+16.29	0.00			
								En	A ↕ 0.50	+15.79	0.50			Firm, light brown (7.5YR 6/4), sandy SILT with some angular to subangular fine gravel sized quartz. (COLLUVIUM)
								En	B ↕ 1.00					Firm, light brown (7.5YR 6/4), sandy SILT with occasional subangular fine gravel sized highly decomposed rock fragments. (COLLUVIUM)
11/02/2011								En	C ↕ 1.50					
04/03/2011			80	100					1 2.50	+14.59	1.70		V	Extremely weak, light brown (7.5YR 6/4), dappled light grey, completely decomposed meta-SILTSTONE. (Sandy SILT with occasional angular fine gravel)
	SW 3.05	0.50m at 18:30						1,2, 3,4,4,3 N=14	2 2.60	+13.69	2.60		V	Extremely weak, light brown, dappled purplish grey, completely decomposed meta-SILTSTONE. (Sandy SILT with occasional angular fine gravel)
04/03/2011									3 2.70					
05/03/2011	PW	1.60m at 08:00		89				37 bls En	4 3.00					
									5 3.05					
			80	90					6 3.50					
									7 3.55					
									8 4.55					
								2,3, 4,6,7,10 N=27	4.85					
									9 4.75					
								7.52×10^{-7} m/sec	10 5.05					
									5.10					
									11 5.55					
			80	100										
		1.90m at 18:30							12 6.55					
05/03/2011									6.65					
07/03/2011		3.70m at 08:00						2,2, 4,5,5,9 N=23	13 6.95					
									7.00					
				89				70 bls En	14 7.10					
									15 7.55					
									7.60	+8.69	7.60		V	Extremely weak, brown, completely decomposed meta-SANDSTONE with some iron and manganese stained kaolin coated relict joints, dipping 30° to 40° and subvertically. (Silty fine to medium SAND with occasional angular fine gravel)
			80	100					16 8.60					
									17 8.70					
								4,13, 14,19,24,32 N=89	18 8.80					
									19 9.10					
									20 9.15					
										+8.69	9.60			
			80						21 9.60				V	Extremely weak, pinkish grey, dappled reddish brown, completely decomposed meta-SILTSTONE. (SILT with

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
■ U100 undisturbed sample
▨ Mazier sample
□ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED T. C. Yip
DATE 29/03/2011
CHECKED E. Leung
DATE 30/03/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. Falling head permeability tests were carried out from 5.10m to 6.60m and 19.15m to 20.65m depth.
3. Piezometers were installed at 4.05m and 69.50m depth.

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH17

CONTRACT NO. GE/2009/15

SHEET 2 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	**CO-ORDINATES**	**W.O.NO.** GE/2009/15.22
MACHINE & NO.	VBM50	E 828231.70 N 841911.86	**DATE :** 11/02/2011 to 23/03/2011
FLUSHING MEDIUM	Water	**ORIENTATION** Vertical	**GROUND LEVEL** +16.29 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW									+6.29	10.00		V	occasional angular fine quartz gravel) See sheet 1 of 7
			80	100				4,4, 6,7,9,10 N=32	22 10.60–10.70 23 10.80 24 11.10 En 25 11.15–11.60					
				85				99 bls		+4.64	11.65		V	Extremely weak, brown, dappled light brown, completely decomposed meta-SANDSTONE. (Silty fine to coarse SAND with some angular fine gravel)
			80	100					27 11.65–12.65 28 12.75					
		1.80m at 18:00						7,10, 10,11,15,16 N=52	29 12.85 30 13.15–13.20					
07/03/2011		5.10m at 08:00							31 13.65					
08/03/2011			80	100					32 14.65–14.75					
								8,13, 15,16,19,22 N=72	33 14.85 34 15.15 35 15.20–15.30					
										+0.64	15.65		V	Extremely weak, brown, dappled light grey, completely decomposed meta-SILTSTONE. (Sandy SILT with some angular fine quartz gravel)
			80	90					36 15.65–16.65 37 16.75	-0.46	16.75			
								4,12, 15,13,14,18 N=60	38 16.85 39 17.15–17.20				V	Extremely weak, light brown, dappled brown, completely decomposed meta-SANDSTONE. (Silty fine to coarse SAND with occasional angular fine gravel)
			80	95					40 17.65 41 18.65–18.75					
		2.10m at 18:00						11,12, 13,14,12,15 N=54	42 18.85 43 19.15–19.20					
08/03/2011		4.30m at 08:00						6.41 x 10^{-7} m/sec		-3.36	19.65			
09/03/2011			80						44 19.65				V	Extremely weak, brown, dappled light brown and dark brown, completely decomposed meta-SANDSTONE with

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
■ U100 undisturbed sample
▨ Mazier sample
□ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremetor test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	29/03/2011
CHECKED	E. Leung
DATE	30/03/2011

REMARKS

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH17

CONTRACT NO. GE/2009/15

SHEET 3 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828231.70 N 841911.86	DATE : 11/02/2011 to 23/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 16.29 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW								-3.71	20.00				
09/03/2011 10/03/2011		4.90m at 08:00	80	100				4,7, 17,21,21,21 N=80	45 20.65 20.75 46 20.85 47 21.15 21.20				V	some iron and manganese stained kaolin coated relict joints, dipping 50° to 60° and 60° to 70°. (Silty fine to coarse SAND with occasional angular fine gravel)
			80	90				5,6, 16,20,22,23 N=81	48 21.65 49 22.65 22.75 50 22.85 51 23.15 23.20					
			80	100				4,7, 14,19,21,22 N=76	52 23.65 53 24.65 24.75 54 24.85 55 25.15 25.20	-7.36	23.65		V	Extremely weak, light brown, completely decomposed meta-SANDSTONE. (Silty fine SAND)
			80	95				4,7, 13,18,27,27 N=85	56 25.65 57 26.65 26.75 58 26.85 59 27.15 27.20	-9.36	25.65		V	Extremely weak, grey, dappled pink, completely decomposed meta-SILTSTONE. (SILT)
			80	100				9,15, 20,24,26,27 N=97	60 27.65 61 28.65 28.75 62 28.85 63 29.15 29.20 64 29.65	-11.36	27.65		V	Extremely weak, brownish grey, dappled light brown, completely decomposed meta-SANDSTONE. (Silty fine SAND)
			80											

Disturbed sample
Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
Water sample
En Environmental Sample
Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED T. C. Yip
DATE 29/03/2011
CHECKED E. Leung
DATE 30/03/2011

REMARKS

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH17

CONTRACT NO. GE/2009/15

SHEET 4 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828231.70 N 841911.86	DATE : 11/02/2011 to 23/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +16.29 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW									-13.71	30.00		V	See sheet 3 of 7
10/03/2011		1.80m at 18:00	80	90					65 30.65 66 30.75					
11/03/2011		4.90m at 08:00						10,18, 30,34,36/50mm (100/200mm)	67 31.05 31.10					
										-15.36	31.65			
			80	90					68 31.65 69 32.65 32.75	-16.46	32.75		V	Extremely weak, grey, dappled light grey, completely decomposed meta-SILTSTONE. (SILT)
								19,35/35mm 100/30mm (100/30mm)	70 32.89				V	Extremely weak, light grey, dappled brown, completely decomposed meta-SANDSTONE. (Silty fine SAND)
			80	89					71 33.65					
11/03/2011		0.60m at 18:00							72 34.55 34.65	-18.26	34.55		IV	Weak to moderately weak, greyish brown, dappled light brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular fine to coarse GRAVEL with occasional angular cobble)
12/03/2011		5.10m at 08:00	80	53	0	0	NI		T2 101	-18.76	35.05		V	From 35.05m to 35.40m : No recovery, inferred to be completely decomposed meta-SANDSTONE.
							NR		73 35.40	-19.11	35.40		V	Extremely weak to very weak, brown, dappled light brown, completely decomposed meta-SANDSTONE. (Slightly silty fine to coarse SAND with some angular fine to coarse gravel and occasional angular cobble)
			80	90					74 36.40 36.50					
								8,42/45mm 100/50mm (100/50mm)	75 36.67 36.69	-20.40	36.69		III	Moderately strong, greyish brown, moderately decomposed QUARTZITE.
12/03/2011		3.30m at 18:00	80	100	15	0	>20		T2 101	-20.74	37.03		IV	Joints are very closely to closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 40° to 50° and 50° to 60°.
14/03/2011		5.10m at 08:00					17.4		76 37.03					Very weak to weak, greyish brown, dappled brown, highly decomposed SANDSTONE. (Recovered as sandy angular fine to coarse GRAVEL with some angular cobble)
			80	70					77 38.03 78 38.13					
			80	95										
								*50/10mm 100/20mm (100/20mm)	79 39.13 80 39.23 39.26	-22.84	39.13		V	Extremely weak to very weak, greyish brown, dappled light brown, completely decomposed meta-SANDSTONE. (Silty fine to coarse SAND with occasional angular fine to medium gravel)

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- v In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED T. C. Yip

DATE 29/03/2011

CHECKED E. Leung

DATE 30/03/2011

REMARKS

J200946e_22

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH17

CONTRACT NO. GE/2009/15

SHEET 5 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828231.70 N 841911.86	DATE : 11/02/2011 to 23/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 16.29 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW								-23.71	40.00				
41			80	95				50/10mm 100/30mm (100/30mm)	81 40.13 82 41.13 83 41.23 41.27				V	See sheet 4 of 7
42										-25.84	42.13			
			80	100					84 42.13				V	Extremely weak to very weak, greyish brown, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with some angular fine to medium gravel)
43								50/20mm 100/30mm (100/30mm)	85 43.13 86 43.23 43.28					
44										-27.84	44.13			
			80	60					87 44.13				IV	Weak, greyish brown, dappled brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular COBBLE with some angular fine to coarse gravel)
45		0.90m at 18:00							88 45.13 45.23	-28.94	45.23			
14/03/2011														
15/03/2011		5.20m at 08:00	80	0					89 45.53 45.63				V	Extremely weak to very weak, greyish brown, completely decomposed meta-SILTSTONE. (SILT with some angular fine to coarse gravel)
							NA			-29.51	45.80			
46		2.10m at 18:00	80	92	17	16	17.6		T2101	-29.85	46.14		IV	Weak to moderately weak, greyish brown, highly decomposed meta-SILTSTONE. Joints are closely spaced, rough and smooth planar, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20°, 40° to 50° and 50° to 60°. From 46.14m to 46.24m : Extremely weak, greyish brown, completely decomposed meta-SILTSTONE. (SILT)
15/03/2011							NA			-29.95	46.24		V	
16/03/2011		4.90m at 08:00					20.0			-30.05	46.34		IV	
									90 46.34				IV	
47			80	100										Very weak, greyish brown, dappled brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular fine to coarse GRAVEL with some angular cobble)
								50/20mm 100/40mm (100/40mm)	91 47.34 92 47.44 47.50					
48										-32.05	48.34			
									93 48.34				IV	Very weak to weak, greyish brown, highly decomposed meta-SILTSTONE. (Recovered as silty angular fine to coarse GRAVEL with some angular cobble)
49			80	100										
	PW 49.50													
	HW							50/10mm 100/20mm (100/20mm)	94 49.34 95 49.44 49.47	-33.31	49.60		V	Extremely weak to very weak, greyish brown, completely decomposed meta-SILTSTONE. (SILT with occasional
50			80	94	6	0	NA		T2101					

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
▮ U100 undisturbed sample
▨ Mazier sample
□ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	29/03/2011
CHECKED	E. Leung
DATE	30/03/2011

REMARKS

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH17

CONTRACT NO. GE/2009/15

SHEET 6 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828231.70 N 841911.86	DATE : 11/02/2011 to 23/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +16.29 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-33.71	50.00			
	HW									-33.81	50.10			angular fine to medium gravel)
		3.80m at 18:00	80	94	5	0	>20		T2 101	-34.01	50.30		IV	From 50.10m to 50.30m : Weak, highly decomposed SILTSTONE.
16/03/2011							NA						V	
17/03/2011		5.30m at 08:00							96 50.50					
51			80	100										
									97 51.50					
								50/30mm 100/50mm (100/50mm)	98 51.60 51.68					
52														
									52.30					
			80	100	0	0	NA		T2 101	-36.21	52.50			From 52.30m to 52.40m : With some angular fine to coarse quartz gravel.
									99 52.50				IV	Weak to moderately weak, brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular COBBLE with some angular fine to coarse gravel)
53			80	33										
		2.70m at 18:00							100 53.40 53.50	-37.21	53.50			
17/03/2011														
19/03/2011		5.10m at 08:00							T2 101				III	Moderately strong, greyish brown, dappled brown, moderately decomposed meta-SANDSTONE. Joints are very closely to closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20°, 40° to 50° and 50° to 60°.
54			80	81	9	0	>20							
							20.0		54.30					
			80	91	13	0	>20		T2 101					
55							16.7							
									55.20					
			80	94	14	0	>20		T2 101					
							13.3							
56		3.10m at 18:00					>20		56.10	-39.81	56.10			
19/03/2011														
21/03/2011		4.80m at 08:00											IV	Weak to moderately weak, greyish brown, dappled brown, highly decomposed meta-SANDSTONE. Highly fractured.
			80	93	0	0	NI		T2 101					
57									57.12					
							>20							
			80	81	0	0	NI		T2 101					
58										-41.81	58.10			
							NA			-42.03	58.32		V	From 58.10m to 58.32m : Extremely weak, light brown, completely decomposed meta-SANDSTONE. (Silty fine to coarse SAND)
							NR			-42.31	58.60			From 58.32m to 58.60m : No recovery, inferred to be completely decomposed meta-SANDSTONE.
									101 58.60				V	Extremely weak to very weak, light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with some angular fine to coarse gravel)
59			80	95										
									102 59.60 59.70					
								50/20mm 100/30mm	103 59.75					
60														

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
■ U100 undisturbed sample
▨ Mazier sample
□ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED T. C. Yip
DATE 29/03/2011
CHECKED E. Leung
DATE 30/03/2011

REMARKS

VIBRO — DRILLHOLE RECORD

HOLE NO. KTN-BH17

CONTRACT NO. GE/2009/15

SHEET 7 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM50	E 828231.70 N 841911.86	DATE : 11/02/2011 to 23/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 16.29 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW							(100/30mm)		-43.71	60.00		V	See sheet 6 of 7
21/03/2011		3.60m at 18:00								-44.31	60.60			
22/03/2011		4.80m at 08:00	80	100					104 60.60				V	Extremely weak to very weak, grey, completely decomposed meta-SILTSTONE. (SILT with some angular fine to medium gravel)
61									105 61.60					
								50/30mm 100/50mm (100/50mm)	106 61.70 61.78					
62														
			80	100					107 62.60					
63														
									108 63.60					
								50/20mm 100/50mm (100/50mm)	109 63.70 63.77					
64														
									110 64.60					
65			80	100										
									111 65.60					
									112 65.70 65.76					
66								50/20mm 100/40mm (100/40mm)	65.90	-49.61	65.90		IV	Weak to moderately weak, brown, dappled greyish brown, highly decomposed meta-SANDSTONE. Joints are closely spaced, rough planar, very narrow to narrow, iron and manganese stained, dipping 0° to 10° and 10° to 20°.
			80	90	25	0	NI		T2101					
							13.3							
							>20							
							13.3		66.70	-50.41	66.70			
67							NA						V	Extremely weak, greyish brown, dappled light brown, completely decomposed meta-SILTSTONE. (SILT with occasional angular fine to medium gravel) From 66.80m to 66.90m : With some angular fine to coarse quartz gravel.
							>20							
			80	50	0	0	NA		T2101	-51.31	67.60			From 67.60m to 68.20m : No recovery, inferred to be completely decomposed meta-SILTSTONE.
68		3.60m at 18:00					NR							
22/03/2011										-51.91	68.20			
23/03/2011		4.90m at 08:00							113 68.20				IV	Very weak, greyish brown, highly decomposed meta-SILTSTONE. (Recovered as silty angular fine to coarse GRAVEL with occasional angular cobble)
			80	100										
69									114 69.20					
								50/10mm 100/20mm (100/20mm)	115 69.30 69.33					
70 23/03/2011	HW 70.00									-53.71	70.00			End of Investigation Hole at 70.00m.

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

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DATE	29/03/2011
CHECKED	E. Leung
DATE	30/03/2011

REMARKS

J200946a_22

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH18
	SHEET 1 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828146.27 N 841708.92	DATE : 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +20.14 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
28/03/2011	SW									+20.14	0.00			Firm, light brown (7.5YR 6/4), slightly sandy SILT with occasional subangular fine to medium gravel sized highly decomposed rock fragments. (COLLUVIUM)
28/03/2011 29/03/2011			90	100						+18.64	1.50		V	Extremely weak, light grey, dappled light brown, completely decomposed meta-SILTSTONE. (Sandy SILT with occasional angular fine gravel)
			90	87	13	0	>20			+18.04	2.10		IV	Weak to moderately weak, light grey, dappled light brown, highly decomposed meta-SANDSTONE. Joints are very closely to closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and occasional manganese stained, dipping 20° to 30°, 30° to 40° and 40° to 50°.
			90	84	28	13	10.6			+17.44	2.70		III	
	SW 3.50						>20			+17.14	3.00		IV	From 2.70m to 3.00m : Moderately strong, moderately decomposed SANDSTONE.
	PW		90	92						+16.64	3.50		V	Extremely weak, white, completely decomposed meta-SILTSTONE. (SILT with occasional angular to subangular fine quartz gravel)
								50/70mm 100/70mm (100/70mm)		+15.54	4.60		IV	Very weak, light grey, highly decomposed meta-SANDSTONE. (Recovered as silty sandy angular to subangular fine to coarse GRAVEL)
			90	80	12	0	>20			+15.34	4.80		IV	Weak to moderately weak, light grey, highly decomposed meta-SANDSTONE. Joints are very closely to closely spaced, rough planar, extremely narrow to very narrow, iron stained, dipping 10° to 20°, 20° to 30° and 30° to 40°.
							12.8			+14.54	5.60		III	
			90	90	22	0	>20			+14.29	5.85		IV	Moderately strong, light brown, dappled reddish brown and brown, moderately decomposed meta-SILTSTONE. Joints are very closely to closely spaced, rough and smooth planar, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20° and 20° to 30°. From 5.85m to 6.20m : Weak to moderately weak, highly decomposed SILTSTONE.
			90	85	32	28	8.3			+13.94	6.20		III	
							>20			+13.44	6.70		IV	
			90	90				1.34 x 10^{-6} m/sec		+12.34	7.80		IV	Extremely weak to very weak, brown, dappled greyish brown, highly decomposed meta-SILTSTONE. (Recovered as silty angular COBBLE with some angular fine to coarse gravel)
								50/60mm 100/70mm (100/70mm)					V	Extremely weak to very weak, light brown, dappled brown, completely decomposed meta-SANDSTONE. (Silty fine SAND)
29/03/2011 30/03/2011		0.56m at 18:00 3.86m at 08:00	80	95				9,24, 39,61/35mm (100/110mm)		+10.34	9.80		V	Extremely weak to very weak, light brown, dappled brown,

Disturbed sample
Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
Water sample
En Environmental Sample
Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	14/04/2011
CHECKED	E. Leung
DATE	15/04/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A falling head permeability test was carried out from 7.20m to 8.70m depth.
3. An acoustic televiewer survey was carried out from 58.63m to 63.81m depth.
4. A piezometer was installed at 58.00m depth.

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH18

CONTRACT NO. GE/2009/15

SHEET 2 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	**CO-ORDINATES**	**W.O.NO.** GE/2009/15.22
MACHINE & NO.	VBM49	E 828146.27 N 841708.92	**DATE :** 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	**ORIENTATION** Vertical	**GROUND LEVEL** +20.14 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW								12 10.01 10.05	+10.14	10.00		V	completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
			85	95					13 10.70					
								50/70mm 100/70mm (100/70mm)	14 11.70 11.80 15 11.94					
									16 12.70	+7.44	12.70		V	Extremely weak to very weak, light brown, dappled light grey, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with much angular fine to coarse quartz gravel)
			85	95										
								50/50mm 100/50mm (100/50mm)	17 13.70 13.80 18 13.90					
									14.70	+5.44	14.70		V	Extremely weak, brown, dappled light brown and greyish brown, completely decomposed meta-SILTSTONE. (SILT)
			85	0										
30/03/2011		0.66m at 18:00							19 15.70 15.80					
31/03/2011		3.61m at 08:00	85	90					20					
									21 16.80 16.00 22 23 17.20 17.25					
								15,25, 27,32,41/50mm (100/200mm)						
									24 17.80	+2.34	17.80		V	Extremely weak, brown, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
			85	90					25 18.80 18.90	+1.24	18.90			
								19,20, 21,22,23,23 N=89	26 19.00 27 19.30 19.35				V	Extremely weak, grey, dappled light brown, completely decomposed meta-SILTSTONE. (SILT)
			85						28 19.80					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

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DATE	14/04/2011
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DATE	15/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH18
	SHEET 3 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828146.27 N 841708.92	DATE : 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 20.14 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level +0.14	Depth (m) 20.00	Legend	Grade	Description
	PW		85	95									V	See sheet 2 of 7
21								50/60mm 100/70mm (100/70mm)	29 20.80 20.90 30 ▼ 21.03					
										-1.66	21.80		V	Extremely weak to very weak, light brown, dappled brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
22			80	95					31 21.80					
23								20,24, 25,32,43/50mm (100/200mm)	32 22.60 33 22.90 34 23.20 23.25					
24	31/03/2011 01/04/2011	1.22m at 18:00 6.36m at 08:00	80	81					35 23.80					
25								35,15/5mm 79,21/5mm (100/80mm)	36 24.80 24.90 37 ▼ 25.06					
26			80	86					38 25.80					
27								50/70mm 100/60mm (100/60mm)	39 26.80 26.90 40 ▼ 27.03					
										-7.66	27.80		V	Extremely weak, light brown, dappled brown, completely decomposed meta-SILTSTONE. (SILT with occasional angular to subangular fine to medium quartz gravel)
28			80	0					27.80					
29			80	0					41 28.80 28.90					
30	PW 30.00								42 29.90 30.00					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	14/04/2011
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REMARKS

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH18

CONTRACT NO. GE/2009/15

SHEET 4 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	**CO-ORDINATES**	**W.O.NO.** GE/2009/15.22
MACHINE & NO.	VBM49	E 828146.27 N 841708.92	**DATE :** 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	**ORIENTATION** Vertical	**GROUND LEVEL** + 20.14 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW							50/40mm 100/60mm (100/60mm)	43 30.10	-9.86	30.00		V	See sheet 3 of 7
			80	95					44 30.90	-10.76	30.90		IV	Very weak to weak, light brown, highly decomposed meta-SILTSTONE. (Recovered as silty angular fine to coarse GRAVEL with some angular cobble)
								50/60mm 100/70mm (100/70mm)	45 31.90 32.00 46 32.13					
			85	85					47 32.90	-12.76	32.90		IV	Weak to moderately weak, light brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular fine to coarse GRAVEL)
								50/30mm 100/40mm (100/40mm)	48 33.90 34.00 49 34.07					
01/04/2011		1.51m at 18:00												
02/04/2011		9.18m at 08:00	80	95					50 34.90	-14.76	34.90		V	Extremely weak, light brown, completely decomposed meta-SANDSTONE. (Silty fine SAND)
								50/50mm 100/60mm (100/60mm)	51 35.90 36.00 52 36.11					
			80	95					53 36.90	-16.76	36.90		V	Extremely weak, brown, dappled light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
								50/50mm 100/70mm (100/70mm)	54 37.90 38.00 55 38.12					
			80	95					56 38.90					
									57 39.90 40.00					

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
▮ U100 undisturbed sample
▨ Mazier sample
□ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
I Permeability test
I Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

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DATE	15/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH18
	SHEET 5 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828146.27 N 841708.92	DATE : 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 20.14 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW							↓50/50mm 100/70mm (100/70mm)	58 ≠ 40.12	-19.86	40.00		V	See sheet 4 of 7
										-20.76	40.90			
41			80	0					40.90				III	Moderately strong, light grey, dappled light brown, moderately decomposed QUARTZ VEIN. (Recovered as angular medium to coarse GRAVEL)
									59 41.90 42.00	-21.86	42.00			
42			80	0									V	Extremely weak, light brown, dappled brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with occasional angular to subangular fine to medium quartz gravel)
43	02/04/2011 04/04/2011	1.32m at 18:00 11.06m at 08:00						↓50/30mm 100/50mm (100/50mm)	60 43.00 61 ≠ 43.10 43.18					
44			80	0					44.00					
45			80	0					62 45.00 45.10					
46								↓50/40mm 100/50mm (100/50mm)	63 46.10 64 ≠ 46.20 46.29					
47			80	0					47.10					
48									65 48.10 48.20					
49			80	0										
								↓50/30mm 100/40mm (100/40mm)	66 49.20 67 ≠ 49.30 49.37					
50														

↕ Disturbed sample
■ Piston sample
U76 undisturbed sample
■ U100 undisturbed sample
▨ Mazier sample
□ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
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REMARKS

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH18

CONTRACT NO. GE/2009/15

SHEET 6 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	**CO-ORDINATES**	**W.O.NO.** GE/2009/15.22
MACHINE & NO.	VBM49	E 828146.27 N 841708.92	**DATE :** 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	**ORIENTATION** Vertical	**GROUND LEVEL** +20.14 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW									-29.86	50.00		V	See sheet 5 of 7
04/04/2011		1.28m at 18:00	80	0					50.20					
06/04/2011		13.23m at 08:00							68 51.20 51.30	-31.16	51.30		V	Extremely weak, light brown, dappled brown and grey, completely decomposed meta-SILTSTONE. (SILT)
			75	0					69 52.30 52.40					
								50/50mm 100/70mm (100/70mm)	70 52.52					
									71 53.30					
			75	95					72 54.30 54.40					
								50/60mm 72,28/15mm (100/90mm)	73 54.50 74 54.55					
									75 55.30					
06/04/2011		1.31m at 18:00	75	60					76 56.30 56.40	-36.26	56.40		V	Extremely weak. light brown, dappled light grey, completely decomposed meta-SILTSTONE. (SILT with some angular to subangular fine to medium quartz gravel)
07/04/2011		16.20m at 08:00	80	0					77 57.40 57.50					
								50/30mm 100/50mm (100/50mm)	78 57.58					
07/04/2011	HW 58.65	1.28m at 18:00	80	0					79 58.40 58.55	-38.26	58.40		IV	Weak to moderately strong, grey, dappled light grey, highly decomposed meta-SILTSTONE. (Recovered as angular fine to coarse GRAVEL with some quartz fragments)
08/04/2011		16.88m at 08:00	80	100	93	86	>20 3.6		T2 101	-38.51	58.65		II	Strong, dark grey, locally dappled light grey and grey, slightly decomposed meta-SILTSTONE. Joints are closely to medium spaced, locally very closely spaced, rough and smooth planar, occasional rough stepped, tight to extremely narrow, clean, dipping 10° to 20°, 20° to 30° and 30° to 40°. From 59.10m to 59.16m : With quartz veins 6mm to 10mm
			80	100	100	44			T2 101 59.86					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	14/04/2011
CHECKED	E. Leung
DATE	15/04/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH18
	SHEET 7 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828146.27 N 841708.92	DATE : 28/03/2011 to 08/04/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +20.14 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-39.86	60.00		II	thick, dipping 40° to 50°. From 60.08m to 60.13m : With quartz veins 10mm thick, dipping 30°.
			80	100	100	44	10.0 4.8 16.4		T2101					
									61.28					From 61.20m to 61.68m : With closely to medium spaced quartz veins 10mm to 25mm thick, dipping 30° to 40° and 50° to 60°.
			80	100	100	82	3.8		T2101					From 61.92m to 62.28m : With closely to medium spaced quartz veins 5mm to 15mm thick, dipping 20° to 30°.
							12.2		62.79					
							2.0							From 62.90m to 63.56m : With closely spaced, quartz veins 5mm to 15mm thick, dipping 10° to 20° and 20° to 30°.
08/04/2011		2.22m at 18:00	80	100	100	81	14.6		T2101					
									64.04	-43.90	64.04			End of Investigation Hole at 64.04m.

↕ Disturbed sample	↓ Standard penetration test	LOGGED	T. C. Yip
■ Piston sample	V In-situ vane shear test		
▨ U76 undisturbed sample	Permeability test	DATE	14/04/2011
■ U100 undisturbed sample	Pressuremeter test		
▨ Mazier sample	Packer Test	CHECKED	E. Leung
▯ SPT liner sample	Acoustic or optical televiewer survey		
▲ Water sample	Piezometer tip	DATE	15/04/2011
En Environmental Sample	Standpipe		

REMARKS

J2009466_22

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH19

CONTRACT NO. GE/2009/15

SHEET 1 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	**CO-ORDINATES**	**W.O.NO.** GE/2009/15.22
MACHINE & NO.	VBM49	E 828333.08 N 841858.73	**DATE :** 08/03/2011 to 22/03/2011
FLUSHING MEDIUM	Water	**ORIENTATION** Vertical	**GROUND LEVEL** + 16.80 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
08/03/2011	SW								A 0.50	+16.80	0.00			Firm, brown (7.5YR 5/4), slightly sandy SILT with occasional angular to subangular fine to medium gravel sized highly decomposed rock fragments. (COLLUVIUM)
								En	B 1.00	+15.80	1.00			
08/03/2011								En	C 1.50					Medium dense, light grey (N 6), dappled light brown, silty fine SAND with occasional subangular fine gravel sized highly decomposed rock fragments. (ALLUVIUM)
09/03/2011			80	90				En	1 2.50					
								3,4,5,7,7,8 N=27	2 2.60					
	SW 3.05								3 2.70					
	PW							96 blows	4 3.00	+13.75	3.05			
				76				En	5 3.05					Firm, light brown (7.5YR 6/4), sandy SILT with occasional subrounded fine to coarse gravel sized quartz and moderately decomposed rock fragments and subrounded cobble sized quartz. (COLLUVIUM)
			80	54					6 3.50					
									7 3.55					
									8 4.55					
			80	40				1.03×10^{-6} m/sec	9 4.65					
										+11.50	5.30			
									10 5.65				V	Extremely weak, purplish grey, streaked light grey, completely decomposed meta-SILTSTONE with occasional kaolin coated relict joints, dipping subvertically. (SILT)
		0.35m at 18:00							5.75					
								2,2,2,3,5,7 N=17	11 5.85					
09/03/2011									12 6.15					
10/03/2011		2.30m at 08:00						72 blows	13 6.20					
				89				En	6.65					
									14 6.70					
			80	88					15					
									16 7.70					
									7.80					
								3,6,7,9,9,13 N=38	17 7.90					
									18 8.20					
									8.25					
									19 8.70					
			80	96										
									20 9.70	+7.00	9.80			
								4,6,8,13,19,28 N=68	9.80				V	Extremely weak, brown, completely decomposed
									21 9.90					

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
▮ U100 undisturbed sample
▨ Mazier sample
▯ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
I Permeability test
I Pressuremeter test
Packer Test
I Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED T. C. Yip
DATE 29/03/2011
CHECKED E. Leung
DATE 30/03/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. Falling head permeability tests were carried out from 4.70m to 6.20m and 15.50m to 17.00m depth.
3. Piezometers were installed at 4.05m and 57.70m depth.

J200946e_22

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH19
	SHEET 2 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828333.08 N 841858.73	DATE : 08/03/2011 to 22/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +16.80 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										+6.80	10.00			
10/03/2011	PW	0.55m at 18:00		99				166 blows En	22 10.20 23 10.25				V	meta-SANDSTONE. (Silty fine SAND with occasional angular fine gravel)
11/03/2011		1.88m at 08:00	85	95					24 10.70 25 10.75	+6.05	10.75		V	Extremely weak, purplish grey, completely decomposed meta-SILTSTONE. (SILT)
								6,10, 12,15,19,21 N=67	26 11.75 11.85 27 11.95 28 12.25 12.30					
			85	96					29 12.75					
								5,9, 13,16,20,26 N=75	30 13.75 13.85 31 13.95					
				99				157 blows En	32 14.25 33 14.30					
	PW 14.80 HW								34 14.75 35 14.80					
			80	91				1.34×10^{-6} m/sec		+0.90	15.90		V	Extremely weak, light brown, completely decomposed meta-SANDSTONE. (Silty fine SAND)
								5,13, 21,21,24,30 N=96	36 15.80 15.90 37 16.00 38 16.30 16.35					
									39 16.80	0.00	16.80		V	Extremely weak, purplish grey, completely decomposed meta-SILTSTONE. (SILT)
11/03/2011		0.52m at 18:00	85	95					40 17.80 17.90					
12/03/2011		2.30m at 08:00						8,12, 19,22,27,31 N=99	41 18.00 42 18.30 18.35					
									43 18.80	-2.00	16.80		V	Extremely weak to very weak, light brown, dappled light grey, completely decomposed meta-SANDSTONE with some kaolin infilled 1mm to 2mm, dipping subvertically. (Silty fine to coarse SAND with some angular fine gravel)
			85	95										
								39,11/5mm 100/60mm (100/60mm)	44 18.80 19.90					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Accoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	29/03/2011
CHECKED	E. Leung
DATE	30/03/2011

REMARKS

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH19

CONTRACT NO. GE/2009/15

SHEET 3 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828333.08 N 841858.73	DATE : 08/03/2011 to 22/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +16.80 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW								45 20.04	-3.20	20.00		V	See sheet 2 of 7
			85	43					46 20.80	-4.00	20.80		V	Extremely weak, brown, completely decomposed meta-SANDSTONE. (Silty fine to coarse SAND with some angular fine gravel)
									47 21.80					
			85	61					48 21.90					
		0.55m at 16:00							49 22.90	-6.20	23.00			
12/03/2011 14/03/2011		2.25m at 08:00						50/70mm 100/60mm (100/60mm)	50 23.13				IV	Very weak, brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular fine to coarse GRAVEL with occasional angular cobble and quartz)
			85	0					23.90					
									51 24.90	-8.20	25.00			
			85	81					52 25.00				V	Extremely weak to very weak, brown, dappled greyish brown, completely decomposed meta-SANDSTONE. (Slightly silty fine to coarse SAND with some angular fine to coarse gravel)
								50/50mm 100/60mm (100/60mm)	53 26.00					
									26.10					
									54 26.21					
			85	82					55 27.00					
									56 28.00					
								50/40mm 100/50mm (100/50mm)	28.10					
									57 28.19					
										-12.20	29.00			
			85	90					58 29.00				V	Extremely weak to very weak, purplish grey, completely decomposed meta-SILTSTONE. (SILT with some angular fine to medium gravel)
									30.00					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED T. C. Yip

DATE 29/03/2011

CHECKED E. Leung

DATE 30/03/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH19
	SHEET 4 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828333.08 N 841858.73	DATE : 08/03/2011 to 22/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 16.80 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW							29,21/25mm 100/25mm (100/25mm)	59 30.10 60 30.23	-13.20	30.00		V	See sheet 3 of 7
			85	95					61 31.00	-14.20	31.00		V	Very weak, light brown, dappled brown, completely decomposed meta-SANDSTONE. (Silty fine to coarse SAND with some angular fine to coarse gravel)
								16,30, 53,47/55mm (100/130mm)	62 32.00 63 32.10 64 32.33 32.38					
			85	0					33.00	-16.20	33.00		IV	Very weak to weak, light brown, dappled brown, highly decomposed meta-SILTSTONE. (Recovered as angular fine to coarse GRAVEL)
14/03/2011		0.50m at 18:00							65 34.00 34.10	-17.30	34.10			
15/03/2011		2.16m at 08:00	85	30					66 35.10 67 35.20 68 35.30				IV	Very weak to weak, light brown, dappled greyish brown and brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular fine to coarse GRAVEL with some angular cobble)
								50/50mm 100/50mm (100/50mm)						
			85	0					36.10					
									69 37.10 70 37.20					
			85	90										
15/03/2011		0.75m at 18:00						50/30mm 100/30mm (100/30mm)	71 38.20 72 38.30 38.36					
16/03/2011		1.98m at 08:00												
									73 39.20	-22.40	39.20		V	Extremely weak to very weak, purplish grey, dappled light brown, completely decomposed meta-SILTSTONE. (SILT with some angular fine to coarse gravel)
			85	95										

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	29/03/2011
CHECKED	E. Leung
DATE	30/03/2011

REMARKS

J200946e_22

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH19
	SHEET 5 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828333.08 N 841858.73	DATE : 08/03/2011 to 22/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +16.80 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW		85							-23.20	40.00		V	See sheet 4 of 7
								50/70mm 100/60mm (100/60mm)	74 40.20 40.30 75 40.43					
41														
			85	95					76 41.20					
42									77 42.20 42.30 78 42.38					
								50/30mm 100/50mm (100/50mm)						
43									79 43.20					
			85	70					80 43.70	-26.90	43.70		IV	Weak to moderately weak, light brown, dappled greyish brown, highly decomposed meta-SILTSTONE. Joints are very closely spaced, locally closely spaced, rough and smooth planar, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20° and 20° to 30°.
44			85	82	8	0	NI		43.60 T2101	-27.75	44.55		V	From 44.55m to 44.75m : No recovery, inferred to be completely decomposed SILTSTONE.
		0.63m at 18:00					NR			-27.95	44.75		III	From 44.75m to 45.00m : Moderately strong, moderately decomposed SILTSTONE.
45	16/03/2011 17/03/2011	2.12m at 08:00					16.0			-28.20	45.00		IV	Very weak, greyish brown, dappled brown, highly decomposed meta-SILTSTONE. (Recovered as silty angular fine to coarse GRAVEL with some angular cobble)
			80	0					45.00					
46									81 46.00 82 46.10					
			80	93										
47								50/30mm 100/40mm (100/40mm)	83 47.10 47.20 84 47.27					
48			80	0					48.10					
49									85 48.90 49.00	-32.10	48.90		IV	Very weak to weak, light brown, dappled greyish brown and brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular fine to coarse GRAVEL with some angular cobble)
			80	98	18	0	NI		T2101	-32.50	49.30		III	Moderately strong, light brown, dappled brown, moderately decomposed meta-SANDSTONE. Joints are very closely to closely spaced, rough planar and
							18.7							
50														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	29/03/2011
CHECKED	E. Leung
DATE	30/03/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH19
	SHEET 6 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	**CO-ORDINATES**	**W.O.NO.** GE/2009/15.22
MACHINE & NO.	VBM49	E 828333.08 N 841858.73	**DATE :** 08/03/2011 to 22/03/2011
FLUSHING MEDIUM	Water	**ORIENTATION** Vertical	**GROUND LEVEL** +16.80 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-33.20	50.00			
	HW	0.68m at 18:00	80	88	18	0	NA		T2 101 50.25	-33.30 -33.45	50.10 50.25		V	rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 0° to 10°, 10° to 20° and occasional 50° to 60°.
17/03/2011														
18/03/2011		2.03m at 08:00					2.0						IV	Extremely weak to very weak, brown, dappled greyish brown, completely decomposed meta-SILTSTONE. (SILT with occasional angular fine gravel)
			80	80	0	0	NA		T2 101	-33.95	50.75		V	From 50.25m to 50.75m : Very weak, light brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular fine to coarse GRAVEL)
51							NR			-34.25	51.05			
									86 51.25	-34.45	51.25		V	From 51.05m to 51.25m : No recovery, inferred to be completely decomposed SILTSTONE.
			80	92										Extremely weak, light purplish grey, dappled light grey, completely decomposed meta-SILTSTONE. (SILT)
52									87 52.25 52.35					
18/03/2011		0.63m at 18:00						50/70mm 100/60mm (100/60mm)	88 52.48					
19/03/2011		1.88m at 08:00												
53									89 53.25					
			80	95										
54									90 54.25 54.35	-37.55	54.35			
								50/75mm 100/65mm (100/65mm)	91 54.49				V	Extremely weak to very weak, light grey, dappled brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
55														
									92 55.25					
			80	93										
56									93 56.25 56.35					
								22,28/55mm 43,57/35mm (100/110mm)	94 95 56.54 56.59					
57														
										-40.45	57.25			
			80	100					96 57.25				IV	Very weak to weak, brown, dappled greyish brown, highly decomposed meta-SANDSTONE. (Recovered as sandy angular COBBLE with some angular fine to coarse gravel)
58	HW 58.20	0.65m at 18:00												
19/03/2011									97 58.10 58.20	-41.40	58.20			
21/03/2011		1.35m at 08:00	80	95	38	28	>20		T2 101	-41.70	58.50		III	Moderately strong, light grey, dappled brown and light brown, moderately decomposed QUARTZITE.
							7.1		58.78	-41.98	58.78		II	Joints are very closely to closely spaced, locally medium spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, occasional clean, dipping 10° to 20°, 40° to 50°, 50° to 60° and occasional 60° to 70°.
59													III	From 58.50m to 58.78m : Strong, slightly decomposed QUARTZITE.
			80	97	10	0	>20		T2 101					From 59.80m to 60.45m : Strong, slightly decomposed QUARTZITE.
										-43.00	59.80			
60							3.1		T2 101 59.89				II	

Disturbed sample	Standard penetration test
Piston sample	V In-situ vane shear test
U76 undisturbed sample	Permeability test
U100 undisturbed sample	Pressuremeter test
Mazier sample	Packer Test
SPT liner sample	Acoustic or optical televiewer survey
Water sample	Piezometer tip
En Environmental Sample	Standpipe

LOGGED	T. C. Yip
DATE	29/03/2011
CHECKED	E. Leung
DATE	30/03/2011

REMARKS

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH19

CONTRACT NO. GE/2009/15

SHEET 7 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM49	E 828333.08 N 841858.73	DATE : 08/03/2011 to 22/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +16.80 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-43.20	60.00		II	See sheet 6 of 7
			80	100	49	49	3.1		T2 101	-43.65	60.45		III	
							NI							
61									60.97					
		0.63m at 15:00	80	94	10	0			T2 101					
21/03/2011									61.48					
22/03/2011		1.93m at 08:00					>20							
62			80	96	5	0			T2 101					
									62.55					
							NI							
							16.7							
63			80	100	42	18	>20		T2 101					
		1.35m at 13:00					17.6			-46.32	63.12		II	From 63.12m to 63.45m : Strong, slightly decomposed QUARTZITE.
22/03/2011							6.1		63.45	-46.65	63.45			
														End of Investigation Hole at 63.45m.
64														
65														
66														
67														
68														
69														
70														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	29/03/2011
CHECKED	E. Leung
DATE	30/03/2011

REMARKS

J200946e_22

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH20
	SHEET 1 OF 5

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM41	E 828650.22 N 841849.24	DATE : 08/03/2011 to 19/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +28.74 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush % Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
08/03/2011	PW									+28.74	0.00			
										+28.64	0.10			Concrete surface.
									En A 0.60					Firm, greyish brown (2.5Y 5/2), sandy SILT with some angular fine to medium gravel sized moderately decomposed rock fragments and occasional brick fragments. (FILL)
									En B 1.10					
									En C 1.60	+27.24	1.50			
			60	100					1 1.60					Firm, light brown (7.5YR 6/4), slightly sandy SILT with occasional subangular fine gravel sized highly decomposed rock fragments. (COLLUVIUM)
									2 2.60 2.70					
								2,2, 2,2,3,3 N=10	3 2.80					
									4 3.10					
		2.10m at 18:00		100				26 bls	En 5 3.15					
08/03/2011									6 3.60	+25.09	3.65			
09/03/2011		2.25m at 08:00	60	90					7 3.65					Firm to stiff, light brown (7.5YR 6/4), dappled reddish brown, slightly sandy SILT with some subangular to subrounded fine to coarse gravel sized highly decomposed rock fragments. (COLLUVIUM)
									8 4.65 4.75					
								4,7, 7,4,4,4 N=19	9 4.85					
									10 5.15 5.20					
										+23.09	5.65			
								9.53 x 10^{-7} m/sec	11 5.65				V	Extremely weak, light brown, dappled brown and greyish brown, completely decomposed SILTSTONE. (SILT)
			60	90					12 6.65 6.75					
									13 6.85					
		0.76m at 18:00						2,3, 5,6,6,7 N=24	14 7.15					
09/03/2011								66 bls	En 15 7.20					
11/03/2011		4.20m at 08:00		100					16 7.65	+21.04	7.70			
			60	97					17 7.70				V	Extremely weak, greyish brown, dappled reddish brown, completely decomposed SILTSTONE. (Slightly sandy SILT)
									18 8.70 8.80					
								2,3, 3,3,4,5 N=15	19 8.90					
									20 9.20 9.25					
										+19.04	9.70			
			60						21 9.70				IV	Very weak to weak, light brown, dappled brown, highly decomposed SILTSTONE. (Recovered as silty sandy

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Maxier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	24/03/2011
CHECKED	E. Leung
DATE	25/03/2011

REMARKS
1. An inspection pit was excavated to 1.60m depth.
2. Falling head permeability tests were carried out from 5.70m to 7.20m and 28.00m to 29.50m depth.
3. An acoustic televiewer survey was carried out from 44.60m to 49.50m depth.
4. Piezometers were installed at 6.70m and 44.00m depth.
5. A sample of equipment blank and field blank were collected.

VIBRO — DRILLHOLE RECORD

HOLE NO. KTN-BH20

CONTRACT NO. GE/2009/15

SHEET 2 OF 5

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM41	E 828650.22 N 841849.24	DATE : 08/03/2011 to 19/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +28.74 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW		60	81						+18.74	10.00		IV	angular COBBLE with some angular fine to coarse gravel)
			60	86	0	0	>20		22 10.50–10.60	+18.14	10.60		III	Moderately strong, light grey, dappled light brown, moderately decomposed SILTSTONE. Joints are very closely to closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20° and 20° to 30°.
11			60	76	45	19	11.1		T2 10.77	+17.57	11.17			
							NR		T2	+17.44	11.30		V	
			60	0					11.30				III	From 11.17m to 11.30m : No recovery, inferred to be completely decomposed SILTSTONE.
12			60	77	10	0	>20		23 11.80–11.90 T2	+16.54	12.20			Moderately strong, light grey, dappled light brown and dark grey, moderately decomposed QUARTZ VEIN. Highly fractured.
			60	100					24 12.20–13.20				V	Extremely weak, light brown, dappled light grey, completely decomposed SILTSTONE. (SILT with occasional angular fine quartz gravel)
13								7,8, 8,9,12,15 N=44	25 13.30–13.40					
		3.40m at 18:00							26 13.40–13.70					
11/03/2011									27 13.70–13.75					
12/03/2011		4.50m at 08:00		93				148 bls En	28 13.75–14.20					
14									29 14.20–14.25					
			60	67					30					
15									31 15.15–15.25	+13.49	15.25			
			60	87	0	0	NI		T2 15.40				III	Moderately strong, light grey, dappled light brown, moderately decomposed QUARTZ VEIN. Highly fractured.
16			60	0										
									32 16.40–16.50	+12.24	16.50			
			60	95					33				V	Extremely weak, light brown, completely decomposed SILTSTONE. (SILT)
17									34 17.50–17.60					
								3,8, 10,12,11,12 N=45	35 17.70–18.00					
18 12/03/2011	PW 18.05	2.90m at 18:00							36					
14/03/2011	HW	6.30m at 08:00		76				157 bls En	37 18.05					
									38 18.50–18.55	+10.19	18.55		V	Extremely weak, brown, dappled grey, completely decomposed SILTSTONE. (SILT with some angular to subangular fine to coarse quartz gravel)
19			60	0										
									39 19.55–19.65	+9.09	19.65			
20			60	94	0	0	>20		T2	+8.74	20.00		III	Moderately strong, light grey, dappled light brown, moderately decomposed QUARTZ VEIN.

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	24/03/2011
CHECKED	E. Leung
DATE	25/03/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH20
	SHEET 3 OF 5

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM41	E 828650.22 N 841849.24	DATE : 08/03/2011 to 19/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 28.74 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW		60	100					40 20.00	+8.74	20.00		IV	Highly fractured. From 20.00m to 20.72m : Very weak to weak, light brown, highly decomposed SILTSTONE. (Recovered as silty angular COBBLE)
									41 20.62 20.72	+8.02	20.72		III	
21			60	86	16	0	NI		T2101					
							10.5		21.22					
			60	88	0	0	>20		T2101	+7.14	21.60			
22		2.16m at 18:00	60	0					21.70				IV	Weak to moderately weak, brown, dappled light brown, highly decomposed SILTSTONE. (Recovered as sandy silty angular COBBLE with some angular medium to coarse gravel)
	14/03/2011								42 22.10 22.20					
	15/03/2011	7.20m at 08:00	60	84	6	0	>20		T2101					
									22.70	+6.04	22.70		III	Moderately strong, light grey, moderately decomposed QUARTZ VEIN.
23			60	80	0	0	NI		T2101	+5.74	23.00		V	Highly fractured.
							NR		23.20	+5.54	23.20		III	From 23.00m to 23.20m : No recovery, inferred to be completely decomposed SILTSTONE.
			60	80	6	0	NI		T2101	+5.34	23.40		V	Extremely weak, light brown, dappled brown, completely decomposed SILTSTONE. (Slightly sandy SILT with occasional angular fine quartz gravel)
							NR			+5.24	23.50			From 23.50m to 23.70m : No recovery, inferred to be completely decomposed SILTSTONE.
24			60	90					43 23.70	+5.04	23.70			
									44 24.70 24.80					
25								7,11, 20,31,49/70mm (100/220mm)	45 24.82 46 25.12 25.17					
									25.70					
26			60	0										
									47 26.70 26.80	+1.94	26.80		III	Moderately strong, light grey, moderately decomposed QUARTZ VEIN.
27			60	0										Highly fractured.
									48 27.40 27.50					
			60	90	0	0	NI		T2101	+0.94	27.80		V	Extremely weak, light brown, dappled light grey, completely decomposed SILTSTONE. (Slightly sandy SILT with occasional angular fine quartz gravel)
							NA							
28			60	95				1.02×10^{-6} m/sec	49 28.00					
									50 29.00 29.10					
29								6,8, 10,10,11,13 N=44	51 29.20 52 29.50 29.55					
30														

Disturbed sample
Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
Water sample
En Environmental Sample

Standard penetration test
v In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	24/03/2011
CHECKED	E. Leung
DATE	25/03/2011

REMARKS

J200946e_22

VIBRO — DRILLHOLE RECORD

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH20
	SHEET 4 OF 5

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM41	E 828650.22 N 841849.24	DATE : 08/03/2011 to 19/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 28.74 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW								53 30.00	-1.26	30.00		V	See sheet 3 of 5
		4.50m at 18:00	60	59										
31 15/03/2011 16/03/2011		7.30m at 08:00	60	100	13	0	13.3		54 30.90 31.00	-2.26	31.00		III	Moderately strong, light grey dappled light brown, moderately decomposed QUARTZ VEIN. Highly fractured.
			60	84	0	0	NI		T2101 31.60					
32			60	63	0	0	NR		T2101 32.10	-3.61	32.35			
			60	0					32.50	-3.76	32.50		V	Extremely weak to very weak, light brown, dappled brown, completely decomposed SILTSTONE. (Sandy SILT with some angular to subangular fine to medium quartz gravel) From 32.35m to 32.50m : No recovery, inferred to be completely decomposed SILTSTONE.
33									55 33.00 33.10	-4.36	33.10		IV	Moderately weak to moderately strong, greyish brown, dappled light brown, highly decomposed meta-SILTSTONE. Joints are very closely to closely spaced, rough and smooth planar, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20° and 20° to 30°.
			60	84	30	0	>20 NI		T2101 33.60	-4.86	33.60		IV	Weak to moderately weak, greyish brown, dappled brown, highly decomposed meta-SILTSTONE. (Recovered as sandy angular fine to coarse GRAVEL with some angular cobble)
34			60	0					56 34.38 34.48	-5.74	34.48		III	Moderately strong, light brown, dappled brown and grey, moderately decomposed meta-SILTSTONE. Joints are closely spaced, locally very closely and medium spaced, rough and smooth planar, extremely narrow to very narrow, iron and manganese stained, dipping 20° to 30°, 40° to 50° and 50° to 60°. From 35.10m to 35.30m : Very weak, highly decomposed meta-SILTSTONE. From 35.40m to 35.65m : Very weak, highly decomposed meta-SILTSTONE.
			60	100	75	39	14.3 >20 5.0		T2101 34.76	-6.36	35.10		IV	
35			60	100	48	23	13.3 >20		35.55	-6.56 -6.65	35.30 35.40		III IV	
							5.9 17.9		T2101	-6.91	35.65		III	
36			60	100	76	49	7.8		T2101	-7.56 -7.71	36.30 36.45		IV III	From 36.30m to 36.45m : Very weak, highly decomposed meta-SILTSTONE.
37	16/03/2011 17/03/2011	2.10m at 18:00 7.40m at 08:00							37.06					
			60	100	76	47	>20 7.1 >20 12.3		T2101					From 37.95m to 37.98m : With quartz veins 30mm thick, dipping 20° to 30°. From 38.30m to 38.33m : With quartz veins 30mm thick, dipping 20° to 30°.
38									38.54	-9.86 -10.01	38.60 38.75		IV V	From 38.60m to 38.75m : Weak to moderately weak, highly decomposed meta-SILTSTONE. From 38.75m to 39.00m : No recovery, inferred to be completely decomposed SILTSTONE.
39			60	50	19	0	NR		T2101	-10.26	39.00			
			60	98	88	39	12.3		39.16	-10.42	39.16		IV III	From 39.00m to 39.16m : Weak to moderately weak, highly decomposed meta-SILTSTONE. From 39.40m to 39.50m : With quartz veins 50mm thick, dipping 20° to 30°. From 39.72m to 39.74m : With quartz veins 25mm thick, dipping 10° to 20°.
40									T2101					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	24/03/2011
CHECKED	E. Leung
DATE	25/03/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. GE/2009/15	HOLE NO. KTN-BH20
	SHEET 5 OF 5

PROJECT Ground Investigation - New Territories East (Term Contract)
Location : Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22
MACHINE & NO.	VBM41	E 828650.22 N 841849.24	DATE : 08/03/2011 to 19/03/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 28.74 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW									-11.26	40.00			
										-11.32	40.06		III	See sheet 4 of 5 Moderately strong, light grey, dappled greyish brown, moderately decomposed QUARTZ VEIN.
			60	85	0	0	NI		T2101	-11.76	40.50		V	Highly fractured.
							NA			-12.12	40.86		V	Extremely weak, grey, dappled greyish brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with occasional angular fine quartz gravel)
41							NR			-12.26	41.00			From 40.86m to 41.00m : No recovery, inferred to be completely decomposed SILTSTONE.
			60	0					41.00					
		2.90m at 18:00							57 41.80					
17/03/2011									41.90	-13.16	41.90			
42 18/03/2011		7.45m at 08:00	60	75	0	0	>20		T2101	-13.61	42.35		IV	Very weak to weak, brownish grey, dappled brown, highly decomposed meta-SILTSTONE.
							NR			-13.76	42.50		V	Joints are very closely spaced, rough and smooth planar, extremely narrow to very narrow, iron and manganese stained, dipping 20° to 30° and 40° to 50°.
									58 42.50				V	From 42.35m to 42.50m : No recovery, inferred to be completely decomposed SILTSTONE.
43			60	96										Extremely weak to very weak, brownish grey, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with some angular fine to medium gravel)
									59 43.50 43.60					
								22,28/55mm 63,37/15mm (100/90mm)	60 43.82					
44														
	HW 44.50													
									44.50	-15.76	44.50		II	Strong, dark grey, stripped and streaked light grey, slightly decomposed meta-SILTSTONE with closely to medium spaced quartz veins 5mm to 15mm thick, dipping 20° to 30° and 30° to 40°.
							8.6							Joints are medium to widely spaced, locally closely spaced, clean, occasional chlorite coated, dipping 0° to 10°, 40° to 50° and 50° to 60°.
45			60	100	100	100			T2101					
		2.60m at 18:00												
46 18/03/2011									45.99					
19/03/2011		7.48m at 08:00												
			60	100	100	100	0.8		T2101					
47														
									47.53					
48			60	100	100	100			T2101					
							4.7							
49									49.08					
			60	100	100	100	1.1		T2101					
		3.30m at 18:00												
19/03/2011									49.72	-20.98	49.72			
50														End of Investigation Hole at 49.72m.

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	24/03/2011
CHECKED	E. Leung
DATE	25/03/2011

REMARKS

J200946a_22

DRILLHOLE RECORD

VIBRO	HOLE NO. KTN-BH21
CONTRACT NO. : GE/2009/15	SHEET 1 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM35	E 827258.80 N 840594.04	DATE : 26/04/2011 to 11/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 8.93 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
26/04/2011	SW									+8.93	0.00			
										+8.83	0.10			Concrete surface.
									En A 0.60					Grey (N 5), slightly silty fine to coarse SAND with some angular to subangular fine to coarse gravel sized moderately decomposed rock fragments. (FILL)
									En B 1.10	+7.93	1.00			
									En C 1.60					Firm, brown (7.5YR 5/4), slightly sandy clayey SILT with some angular to subangular fine to medium gravel sized moderately decomposed rock fragments and concrete fragments. (FILL)
26/04/2011									En D 2.00					
27/04/2011									1	+6.93	2.00			
			80	100										Firm, grey (N 5), dappled light brown and dark brown, sandy SILT with occasional angular to subangular fine gravel sized highly decomposed rock fragments. (ALLUVIUM)
									2 3.00 3.10					
								1,2, 3,4,4,6 N=17	3 3.20					
									4 3.50	+5.38	3.55			
								40 blS	En 5 3.55					Grey (N 5), dappled light brown, slightly silty / clayey fine to coarse SAND with some subangular fine to coarse gravel sized moderately decomposed rock fragments and quartz fragments. (ALLUVIUM)
				84										
									6 4.00 4.05	+4.88	4.05			
			80	0					7 4.45 4.55					Light grey (N 6), angular to subangular medium to coarse GRAVEL sized quartz fragments and occasional angular cobble sized quartz. (ALLUVIUM)
										+4.03	4.90			
			80	50					T2101					Firm, light grey (N 6), slightly sandy SILT with some angular to subangular fine to coarse gravel sized quartz fragments. (ALLUVIUM)
	SW 5.45													
	PW													
			80	0					5.45					
								6.67×10^{-7} m/sec						
								112 blS	8 6.45 6.55 En	+2.38	6.55		V	Extremely weak, light grey, completely decomposed fine ash crystal TUFF. (Slightly sandy SILT with occasional angular fine quartz gravel)
				84					9					
									10 7.00 7.05					
								1,3, 2,4,6,8 N=20	11 7.15					
									12 7.45	+1.43	7.50			
									13 7.50				V	Extremely weak to very weak, light brown, dappled brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with some angular fine to coarse gravel)
			80	100										
		0.60m at 18:00							14 8.50 8.60					
27/04/2011									15 8.68					
28/04/2011		2.40m at 08:00						50/30mm 100/50mm (100/50mm)						
										-0.57	9.50			
									16 9.50				V	Extremely weak, light brown, dappled pink, completely decomposed coarse ash crystal TUFF. (SILT with occasional angular to subangular fine quartz gravel)
			80											

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	17/05/2011
CHECKED	E. Leung
DATE	18/05/2011

REMARKS
1. An inspection pit was excavated to 2.00m depth.
2. Falling head permeability tests were carried out from 6.30m to 7.80m and 18.50m to 20.00m depth.
3. An acoustic televiewer survey was carried out from 54.84m to 64.84m depth.
4. Piezometers were installed at 7.00m and 41.40m depth.

DRILLHOLE RECORD

VIBRO

HOLE NO. KTN-BH21

CONTRACT NO. : GE/2009/15

SHEET 2 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM35	E 827258.80 N 840594.04	DATE : 26/04/2011 to 11/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 8.93 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW		80	100					17 10.50–10.60	-1.07	10.00		V	See sheet 1 of 7
								7,11, 15,17,19,21 N=72	18 10.70					
11								152 bls	19 11.00					
				89					En 20 11.05–11.50					
									21 11.55					
12			80	100					22 12.55					
									23 12.65					
								8,12, 17,18,40,25/15mm (100/240mm)	24 12.69					
13									25 12.99–13.04					
		0.60m at 18:00												
	28/04/2011								26 13.55	-4.62	13.55		V	Extremely weak, pinkish brown, dappled light grey, completely decomposed coarse ash crystal TUFF. (SILT with occasional angular to subangular fine to coarse gravel and occasional angular cobble sized quartz)
	29/04/2011	2.60m at 08:00												
14			80	83					27 14.55–14.65	-5.72	14.65		V	Extremely weak, reddish brown, dappled greyish brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular to subangular fine quartz gravel)
								3,8, 22,27,25,26/45mm (100/270mm)	28 14.72					
15									29 15.02–15.07					
									30 15.55					
16			80	90					31 16.55–16.65					
									32					
								6,9, 14,26,60/50mm (100/200mm)	33 16.95–17.00					
17														
									34 17.55					
18			80	90					35 18.55–18.65	-9.72	18.65		V	Extremely weak to very weak, light brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with some angular fine to coarse gravel)
								8,16, 25,36,39/60mm (100/210mm)	38 18.66–18.96					
19									37 19.01					
								7.49×10^{-7} m/sec						
									38 19.55					
			80											
20														

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
■ U100 undisturbed sample
▨ Mazier sample
□ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
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DATE	18/05/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH21
	SHEET 3 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES		W.O.NO.	GE/2009/15.22A
MACHINE & NO.	VBM35	E 827258.80	N 840594.04	DATE :	26/04/2011 to 11/05/2011
FLUSHING MEDIUM	Water	ORIENTATION	Vertical	GROUND LEVEL	+ 8.93 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-11.07	20.00		V	See sheet 2 of 7
	PW	0.70m at 18:00	80	80					39 20.55					
29/04/2011									40 20.65					
30/04/2011		2.90m at 08:00						50/10mm 100/40mm (100/40mm)	20.70					
21										-12.62	21.55			
									41 21.55				iV	Very weak to weak, light brown, highly decomposed coarse ash crystal TUFF. (Recovered as sandy angular fine to coarse GRAVEL with occasional angular cobble)
22			80	90					22.55					
									42 22.65					
								50/20mm 100/50mm (100/50mm)	43 22.72	-13.79	22.72		IV	Weak to moderately weak, light brown, dappled light grey, highly decomposed coarse ash crystal TUFF. (Recovered as sandy angular COBBLE with some angular fine to coarse gravel)
23			80	98	6	0	>20			-14.12	23.05		V	
							NA		T2101	-14.59	23.52		V	Extremely weak to very weak, greyish brown, dappled brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular fine to coarse gravel)
									44 23.52					
24			80	100										Extremely weak, light brown, dappled reddish brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular fine gravel)
									45 24.52					
								18,32/45mm 100/70mm (100/70mm)	24.62					
25									46 24.81					
									47 25.52					
26			80	100										
	PW	0.70m at 18:00							48 26.52					
30/04/2011	26.70								26.62					
03/05/2011	HW	2.90m at 08:00						50/20mm 100/60mm (100/60mm)	49 26.70					
27										-18.59	27.52			
									50 27.52				V	Extremely weak to very weak, grey, dappled light brown and brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with occasional angular fine to medium gravel)
28			80	100										
									51 28.52					
								50/30mm 100/40mm (100/40mm)	52 28.62 28.69					
29														
									53 29.52					
			80											
30														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	17/05/2011
CHECKED	E. Leung
DATE	18/05/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15		HOLE NO. KTN-BH21
		SHEET 4 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM35	E 827258.80 N 840594.04	DATE : 26/04/2011 to 11/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 8.93 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW			100						-21.07	30.00		V	See sheet 3 of 7
			80					↓50/30mm 100/70mm (100/70mm)	54 30.52 55 30.62 30.72					
31														
									56 31.52					
32			80	100										
									57 32.52 58 32.62 32.67					
33								↓50/20mm 100/30mm (100/30mm)						
										-24.59	33.52			
									59 33.52				V	Extremely weak to very weak, grey, dappled light brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with some angular fine to coarse gravel)
34			80	100										
									60 34.52 61 34.62 34.68					
35								↓50/10mm 100/50mm (100/50mm)						
									62 35.52					
36			80	86										
									63 36.52 64 36.62 36.67					
37								↓50/10mm 100/40mm (100/40mm)						
										-28.59	37.52			
									65 37.52				IV	Very weak, light brown, dappled brown, highly decomposed coarse ash crystal TUFF. (Recovered as silty sandy angular COBBLE)
38			80	89										
									66 38.42 38.52	-29.59	38.52			
							7.1			-29.87	38.80		III	Moderately strong, light grey, dappled brown, moderately decomposed coarse ash crystal TUFF. Joints are closely spaced, rough planar, extremely narrow to very narrow, iron and manganese stained, dipping 0° to 10°. From 38.80m to 39.00m : Quartz vein.
39			80	93	25	15	NI	T2101		-30.07	39.00		V	Extremely weak to very weak, greyish brown, dappled light brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with occasional angular fine to coarse gravel)
							NA		67 39.40					
40			80	50										

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	17/05/2011
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DATE	18/05/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH21
	SHEET 5 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM35	E 827258.80 N 840594.04	DATE : 26/04/2011 to 11/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +8.93 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW									-31.07	40.00		V	See sheet 4 of 7
03/05/2011		0.90m at 18:00	80						68 40.40					From 40.40m to 40.50m : With much angular fine to coarse quartz gravel.
04/05/2011		3.10m at 08:00							69 40.50	-31.57	40.50		IV	Weak to moderately weak, light brown, dappled greyish brown and brown, highly decomposed coarse ash crystal TUFF. (Recovered as sandy angular COBBLE with some angular fine to coarse gravel)
41			70	67					70 41.10					
									41.20	-32.57	41.50		V	
			70	77	14	0	>20		T2101	-32.73	41.66		III	From 41.50m to 41.66m : No recovery, inferred to be completely decomposed TUFF.
							NR							Moderately strong, greyish brown, dappled light brown and brown, moderately decomposed slightly metamorphosed coarse ash crystal TUFF.
							8.3		41.90					Joints are closely spaced, locally very closely and medium spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 20° to 30° and 40° to 50°.
42			70	100	95	67	4.0		T2101					
									42.53					
							11.7							
43														
							3.7							
			70	97	60	53	12.5		T2101					
							>20			-34.57	43.50			
							7.1			-34.72	43.65		IV	From 43.50m to 43.65m : Weak to moderately weak, highly decomposed TUFF.
		2.10m at 18:00					NI			-34.85	43.78		III	From 43.78m to 43.90m : Weak to moderately weak, highly decomposed TUFF.
44	04/05/2011						4.8			-34.97	43.90		IV	
	05/05/2011	3.30m at 08:00							44.03	-35.10	44.03		III	From 44.03m to 44.15m : Weak to moderately weak, highly decomposed TUFF.
							>20			-35.22	44.15		IV	
													III	
			50	95	61	8			T2101					
45							13.8							
									45.27					
										-36.67	45.60			
							>20			-36.87	45.80		IV	From 45.60m to 45.80m : Weak to moderately weak, highly decomposed TUFF.
46			50	100	84	38	17.0		T2101				III	
							7.1							
									46.76	-37.83	46.76		IV	From 46.76m to 47.25m : Weak to moderately weak, highly decomposed TUFF.
47														
							11.1			-38.32	47.25		III	
			50	85	67	29			T2101	-38.54	47.47		V	From 47.47m to 47.70m : No recovery, inferred to be completely decomposed TUFF.
							NR			-38.77	47.70		III	
										-38.87	47.80		IV	From 47.80m to 48.00m : Weak to moderately weak, highly decomposed TUFF.
48							9.1			-39.07	48.00		III	
									48.25	-39.32	48.25		IV	Weak to moderately weak, grey, dappled light brown, highly decomposed coarse ash crystal TUFF.
							NI							Joints are extremely closely to very closely spaced, locally closely spaced, rough planar, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20°, 40° to 50° and 50° to 60°.
			50	90	10	0	5.9		T2101	-39.77	48.70			From 48.70m to 49.20m : Extremely weak to very weak, light grey, dappled light brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular to subangular fine quartz gravel)
49	05/05/2011	2.10m at 18:00					NA						V	
	06/05/2011	3.20m at 08:00							49.08	-40.27	49.20			
							NI						IV	
			50	87	23	23	>20		T2101	-40.57	49.50			From 49.50m to 49.85m : Moderately strong, moderately
							6.7						III	
									49.79	-40.92	49.85			
50			50	84	30	0	NI		T2101				IV	

- Disturbed sample
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- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	17/05/2011
CHECKED	E. Leung
DATE	18/05/2011

REMARKS

DRILLHOLE RECORD

VIBRO	CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH21
		SHEET 6 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM35	E 827258.80 N 840594.04	DATE : 26/04/2011 to 11/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 8.93 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW		50	84	30	0			T2 01 50.16	-41.07	50.00		IV	decomposed TUFF.
			50	94	0	0	NI		T2 01	-41.67	50.60		V	From 50.60m to 50.80m : Extremely weak to very weak, light grey, dappled light brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular to subangular fine quartz gravel)
							NA		50.80	-41.87	50.80		IV	
51			50	0					71 51.25		51.35			Very weak to weak, light brown, highly decomposed coarse ash crystal TUFF. (Recovered as sandy angular COBBLE with some angular fine to coarse gravel)
		2.20m at 18:00	50	100	50	0	>20		T2 01	-42.42	51.35		IV	
06/05/2011									51.75	-42.57	51.50		III	Moderately strong, grey, spotted light grey, moderately decomposed metamorphosed coarse ash crystal TUFF. Joints are closely spaced, rough planar, extremely narrow, clean, dipping 20° to 30°, 40° to 50° and 50° to 60°.
07/05/2011		3.20m at 08:00					4.5			-43.17	52.10		IV	From 51.35m to 51.50m : Weak to moderately weak, highly decomposed TUFF.
52			60	98	65	27	10.0		T2 01	-43.57	52.50		III	From 52.10m to 52.50m : Weak to moderately weak, highly decomposed TUFF.
							NI			-43.77	52.70		IV	
	HW 53.01						>20		52.95	-44.05	52.98		III	From 52.70m to 52.98m : Weak to moderately weak, highly decomposed TUFF.
53			60	93	35	0	12.2		T2 01					
									54.01					
54			60	98	78	50	2.7							
							9.3		T2 01	-45.87	54.80			
										-45.97	54.90		IV	From 54.80m to 54.90m : Weak to moderately weak, highly decomposed TUFF.
55							>20						III	From 54.90m to 54.95m : With quartz veins 35mm thick, dipping 20° to 30°.
							4.8		55.54	-46.67	55.60		IV	From 55.60m to 55.90m : Weak to moderately weak, highly decomposed TUFF.
							>20			-46.97	55.90		III	From 55.98m to 56.08m : With quartz veins 15mm thick, dipping 60°.
56			60	100	87	51	8.8		T2 01					
							11.8							
57							5.0		57.04	-48.27	57.20			
							13.2			-48.47	57.40		IV	From 57.20m to 57.40m : Weak to moderately weak, highly decomposed TUFF.
			60	100	89	32	5.0		T2 01				III	
58							12.3							
		2.60m at 18:00								-49.47	58.40			
07/05/2011									58.54				IV	From 58.40m to 59.20m : Weak to moderately weak, highly decomposed TUFF.
09/05/2011		3.20m at 08:00					16.3							
59			60	100	71	20			T2 01	-50.27	59.20		III	Moderately strong, grey, spotted light grey, moderately decomposed metamorphosed coarse ash crystal TUFF. Joints are closely spaced, locally very closely spaced, rough planar, extremely narrow, clean, dipping 20° to 30°, 30° to 40° and 40° to 50°.
							7.7							
							>20		59.74					
60			60	100	96	50	13.5		T2 01					

↕ Disturbed sample
■ Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
▲ Water sample
En Environmental Sample

Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	17/05/2011
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REMARKS

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH21

CONTRACT NO. : GE/2009/15

SHEET 7 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM35	E 827258.80 N 840594.04	DATE : 26/04/2011 to 11/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +8.93 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-51.07	60.00		III	See sheet 6 of 7
			60	100	96	50	13.5 >20 5.3		T2101	-51.67 -51.87	60.60 60.80			From 60.60m to 60.80m : Quartz vein.
61							8.5		61.24				II	Strong, locally moderately strong, grey, streaked and spotted light grey, slightly decomposed metamorphosed coarse ash crystal TUFF. Joints are closely to medium spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow, clean and occasional iron stained, dipping 10° to 20°, 20° to 30°, 30° to 40° and occasional 50°. From 61.30m to 61.45m : With closely spaced, quartz veins 10mm thick, dipping 40° to 50°.
62		2.80m at 18:00	60	100	85	76	3.8 20.0 6.5		T2101					
09/05/2011 11/05/2011		3.10m at 08:00							62.43					
63							18.5 8.3		T2101					
			80	100	92	53	3.3 13.0		63.93					
64							4.8 >20		T2101					From 64.12m to 64.15m : With quartz veins 10mm thick, dipping 10°. From 64.25m to 64.35m : With closely spaced, quartz veins 10mm to 15mm thick, dipping 10° to 20°.
65 11/05/2011		2.20m at 18:00	80	100	98	90	6.2		65.17	-56.24	65.17			
														End of Investigation Hole at 65.17m.
66														
67														
68														
69														
70														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED T. C. Yip

DATE 17/05/2011

CHECKED E. Leung

DATE 18/05/2011

REMARKS

DRILLHOLE RECORD

VIBRO	HOLE NO. KTN-BH22
CONTRACT NO. : GE/2009/15	SHEET 1 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM46	E 828332.45 N 840465.93	DATE : 27/04/2011 to 05/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 11.42 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
26/04/2011	SW									+11.42	0.00			
								En	A ↕ 0.50	+10.92	0.50			Greyish brown (2.5Y 5/2), silty fine to coarse SAND with some angular to subangular fine to medium gravel sized highly decomposed rock fragments and rootlets. (COLLUVIUM)
								En	B ↕ 1.00					Brown (7.5YR 5/4), dappled light brown, silty fine to coarse SAND with some angular to subangular fine to coarse gravel sized highly decomposed and moderately decomposed rock fragments. (COLLUVIUM)
26/04/2011								En	C ↕ 1.50					
27/04/2011			85	95					1 2.50	+9.72	1.70			Firm, light brown (7.5YR 6/4), dappled reddish brown, slightly sandy clayey SILT with occasional subangular to subrounded fine gravel sized highly decomposed rock fragments. (COLLUVIUM)
									2 2.60					
		2.65m at 18:00						2,2, 2,2,2,2 N=8	3 2.70					
27/04/2011								28 bls	4 3.00	+8.37	3.05			
28/04/2011		2.16m at 08:00		87				En	5 3.05				V	Extremely weak, light brown, dappled reddish brown, completely decomposed fine ash crystal TUFF. (Slightly sandy SILT with occasional angular to subangular fine quartz gravel)
			85	95					6 3.50					
									7 3.55					
									8 4.55 4.65					
	SW 5.10							3,4, 4,4,5,6 N=19	9 4.75					
	PW	0.65m at 18:00							10 5.05 5.10					
28/04/2011														
29/04/2011		1.82m at 08:00							11 5.55					
			80	95				6.67 x 10^{-7} m/sec						
									12 6.55 6.65					
								2,2, 3,3,5,5 N=16	13 6.75					
								69 bls	14 7.05					
								En	15 7.10					
		0.62m at 18:00		100					16 7.55	+3.82	7.60			
29/04/2011									17 7.60				V	Extremely weak to very weak, light brown, dappled greyish brown, completely decomposed metamorphosed fine ash crystal TUFF. (Sandy SILT with much angular fine to coarse gravel and occasional angular cobble)
30/04/2011		2.06m at 08:00	80	95										
									18 8.60 8.70					
								20,28, 39,61/35mm (100/110mm)	19 8.96					
										+1.82	9.60			
			85						20 9.60				V	Extremely weak, light brown, dappled brown, completely decomposed metamorphosed fine ash crystal TUFF.

- ↕ Disturbed sample
- ■ Piston sample
- U76 undisturbed sample
- ■ U100 undisturbed sample
- Mazier sample
- SPT liner sample
- ▲ Water sample
- En Environmental Sample
- ↓ Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	16/05/2011
CHECKED	E. Leung
DATE	17/05/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. Falling head permeability tests were carried out from 6.10m to 7.60m and 19.50m to 21.00m depth.
3. An acoustic televiewer survey was carried out from 21.66m to 26.56m depth.
4. Piezometers were installed at 9.10m and 21.30m depth.
5. A sample for equipment blank and field blank was collected between 19.25m and 19.70m.
6. A duplicate environmental sample was collected between 19.25m and 19.70m.

DRILLHOLE RECORD

VIBRO	HOLE NO. KTN-BH22
CONTRACT NO. : GE/2009/15	SHEET 2 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM46	E 828332.45 N 840465.93	DATE : 27/04/2011 to 05/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 11.42 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level +1.42	Depth (m) 10.00	Legend	Grade	Description
	PW		85	95					21 10.60–10.70				V	(Slightly sandy SILT with occasional angular fine quartz gravel)
11								6,7, 9,9,15,17 N=50 78 bls	22 10.80					
				100					23 11.10					
									En 24 11.15–11.60					
									25 11.60–11.65	-0.23	11.65		V	Extremely weak to very weak, light brown, dappled light grey, completely decomposed metamorphosed fine ash crystal TUFF. (Slightly sandy SILT with some angular fine to coarse gravel and occasional angular cobble)
12			85	95					26 12.65–12.75					
									27	-1.33	12.75		V	Extremely weak, light brown, dappled greyish brown, completely decomposed slightly metamorphosed coarse ash crystal TUFF. (Sandy SILT with some angular to subangular fine quartz gravel)
13								9,16, 18,20,20,22 N=80	28 12.85					
									29 13.15–13.20					
									30 13.65					
14			85	95					31 14.65–14.75					
		1.03m at 18:00						6,8, 10,12,14,18 N=54 143 bls	32 14.85					
15	30/04/2011								33 15.15					
	03/05/2011	2.80m at 08:00		100					En 34 15.20–15.65					
									35 15.70					
16			85	95					36					
									37 16.70–16.80					
								6,7, 10,13,14,16 N=53	38 16.90					
17									39 17.20–17.25					
									40 17.70					
									41 18.70–18.80					From 18.70m to 18.80m : With kaolin infilled relict joints 2mm thick, dipping 65°.
18			85	95					42 18.90					
								6,8, 11,13,15,17 N=56 94 bls	43 19.20–19.25	-7.83	19.25			
19									En 44 19.25–19.70				V	Extremely weak to very weak, light brown, dappled greyish brown and brown, completely decomposed slightly metamorphosed coarse ash crystal TUFF. (Sandy SILT with occasional angular fine to medium gravel)
				97					8.35 x 10^{-7} m/sec					
									45 19.70–19.75					
20			85						46					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	16/05/2011
CHECKED	E. Leung
DATE	17/05/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH22
	SHEET 3 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM46	E 828332.45 N 840465.93	DATE : 27/04/2011 to 05/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +11.42 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW									-8.58	20.00		V	See sheet 2 of 3
21		2.20m at 13:00	85	95				7,7, 8,12,14,18 N=52	47 20.75 20.85 48 20.95 49 21.25 21.30	-9.94	21.36			
03/05/2011									21.36				III	Strong, grey, streaked and spotted light grey, slightly decomposed coarse ash crystal TUFF. Joints are medium spaced, locally closely spaced, rough planar and rough stepped, extremely narrow, clean and calcite infilled 1mm to 2mm, dipping 10° to 20°, 40° to 50° and 50° to 60°.
04/05/2011	PW 21.66	2.75m at 08:00	85	100	0	0	>20		T2101					
22							>20		21.81	-10.48	21.90		II	From 21.36m to 21.90m : Moderately strong, moderately decomposed TUFF.
		1.83m at 18:00	85	98	70	23	10.9		T2101					
04/05/2011									22.81					
05/05/2011		3.12m at 08:00												
23			85	100	100	95	3.9		T2101					From 23.60m to 23.64m : With quartz veins 10mm to 15mm thick, dipping subvertically.
24									24.23					
25			85	100	100	86	1.5		T2101					From 25.10m to 25.20m : With slickensided planar joints, dipping 10° and 30°.
									25.69					
26							5.9							
			85	100	100	84			T2101					From 26.14m to 26.25m : With slickensided planar joints, dipping 45°.
05/05/2011		1.21m at 18:00					8.1		26.87	-15.45	26.87			
27														End of Investigation Hole at 26.87m.
28														
29														
30														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	16/05/2011
CHECKED	E. Leung
DATE	17/05/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH23
	SHEET 1 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 829728.61 N 840340.80	DATE : 05/05/2011 to 11/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 8.33 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
05/05/2011	SW									+8.33	0.00			
									En A 0.50	+7.83	0.50			Brown (7.5YR 5/4), silty fine to coarse SAND with some angular fine to coarse gravel sized moderately decomposed rock fragments. (FILL)
									En B 1.00					Firm, light grey (N 6), dappled light brown, slightly sandy clayey SILT with occasional subangular fine quartz gravel. (ALLUVIUM)
05/05/2011									En C 1.50	+6.83	1.50			
06/05/2011			80	95					1 2.50					Firm, light grey (N 6), dappled reddish brown, silty CLAY with occasional subangular fine quartz gravel. (ALLUVIUM)
	SW 2.60								2 2.60	+5.73	2.60			
	PW							2,3, 4,3,3,4 N=14 52 blows	3 2.70					Medium dense, light grey (N 6), silty / clayey fine to coarse SAND with some subangular fine quartz gravel. (ALLUVIUM)
				100					4 3.00	+5.28	3.05			
									En 5 3.05					Firm, light grey (N 6), clayey SILT. (ALLUVIUM)
			80	95					6 3.50					
									7 3.55					
									8 4.55	+3.68	4.65			
								3,7, 12,22,29,33 N=96	4.65					
									9 4.75					Very dense, light grey (N 6), slightly silty / clayey fine to coarse SAND with much angular to subangular fine quartz gravel. (ALLUVIUM)
									10 5.10					
									11 5.55					
										+2.38	5.95			
			80	82						+2.18	6.15		V	Light grey (N 6), slightly sandy angular to subangular fine to coarse GRAVEL sized quartz fragments. (ALLUVIUM)
									12 6.55					Extremely weak, light brown, dappled greyish brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT)
									6.65					
								2,3, 3,4,6,5 N=18 35 blows	13 6.75					
									14 7.05					
				100					En 15 7.10					
								7.60 x 10^{-7} m/sec	16 7.55					
			80	95					17 7.60					
									18 8.60					
									8.70					
		0.22m at 18:30						3,3, 5,4,6,7 N=22	19 8.80					
06/05/2011									20 9.10					
07/05/2011		2.12m at 08:00							9.15					
										-1.27	9.60			
			80						21 9.60				V	Extremely weak, brown, dappled light brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	18/05/2011
CHECKED	E. Leung
DATE	20/05/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. Falling head permeability tests were carried out from 7.20m to 8.70m and 18.50m to 20.00m depth.
3. An acoustic televiewer survey was carried out from 21.20m to 26.33m depth.
4. Piezometers were installed at 4.60m and 20.50m depth.

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH23
	SHEET 2 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study -- Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 829728.61 N 840340.80	DATE : 05/05/2011 to 11/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 8.33 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW			95						-1.67	10.00		V	with some angular fine gravel)
		0.32m at 18:30	80					50/55mm 100/45mm (100/45mm)	22 10.60 10.70 23 10.80					
11 07/05/2011 09/05/2011		2.15m at 08:00						150 bls	En 24 11.15					
				93					25 11.60 26 11.65					From 11.60m to 11.65m : With some angular fine to coarse quartz gravel.
12			80	59										
									27 12.50 12.60	-4.27	12.60		III	From 12.50m to 12.60m : With some angular fine to coarse quartz gravel.
13			80	85	0	0	NI	T2 (0)		-4.87	13.20			Moderately strong, grey, moderately decomposed QUARTZ VEIN. Fractured.
				93				176 bls	28 13.20				V	Extremely weak, greyish brown, dappled brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT)
									29 13.65 13.70					
								3,6, 8,11,13,19 N=51	30 13.80					
14				96				85 bls	En 31 14.10 32 14.15					
									33 14.60 34 14.65					From 14.60m to 14.65m : With occasional angular fine to coarse quartz gravel.
15			80	95										
									35 15.65 15.75					
								4,6, 8,11,13,14 N=46	36 15.85					
16									37 16.15 16.20					
									38 16.65					
17			80	95										
									39 17.65 17.75					
								4,6, 12,14,15,18 N=59	40 17.85					
18				93				147 bls	41 18.15 En 42 18.20					
								8.60 x 10^{-7} m/sec	43 18.65	-10.37	18.70		IV	Very weak to weak, brown, dappled grey and greyish brown, highly decomposed coarse ash crystal TUFF. (Recovered as silty sandy angular fine to coarse GRAVEL with occasional angular cobble)
19			80	85					44 18.70					
								50/25mm 100/35mm (100/35mm)	45 19.70 19.80 46 19.86					
20 09/05/2011	PW 20.00	0.33m at 18:30												

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	18/05/2011
CHECKED	E. Leung
DATE	20/05/2011

REMARKS

DRILLHOLE RECORD

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH23
	SHEET 3 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 829728.61 N 840340.80	DATE : 05/05/2011 to 11/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +8.33 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
11/05/2011	HW	2.20m at 08:00								-11.67	20.00		IV	See sheet 2 of 3
			80	0					47 20.70 20.90 21.00	-12.67	21.00			
	HW 21.20		80	76	24	0	>20		T2101 21.29				II	Strong, grey, spotted light grey, slightly decomposed slightly metamorphosed coarse ash crystal TUFF. Joints are closely to medium spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, occasional clean, dipping 10° to 20°, 20° to 30°, 40° to 50° and occasional 60° to 70°.
			80	100	82	59	13.5							
							3.3		T2101 22.61					
							15.8							
			80	100	86	71	5.8		T2101 23.79					
							11.3							
			80	100	74	48			T2101 24.67					
							3.7							
			80	100	95	82	>20		T2101 25.50					
							9.1			-17.30	25.63		III	From 25.63m to 25.80m : Moderately strong, moderately decomposed TUFF.
							>20			-17.47	25.80		II	
			80	100	83	45	6.9		T2101 26.67	-18.34	26.67			
11/05/2011		0.27m at 18:00												End of Investigation Hole at 26.67m.

↕ Disturbed sample	↓ Standard penetration test	LOGGED	T. C. Yip
■ Piston sample	V In-situ vane shear test	DATE	18/05/2011
▨ U76 undisturbed sample	⊥ Permeability test	CHECKED	E. Leung
■ U100 undisturbed sample	⊣ Pressuremeter test	DATE	20/05/2011
▨ Mazier sample	⊟ Packer Test		
▯ SPT liner sample	⊻ Acoustic or optical televiewer survey		
▲ Water sample	▲ Piezometer tip		
En Environmental Sample	⊓ Standpipe		

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH24
	SHEET 1 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM39	E 829588.70 N 841839.68	DATE : 05/05/2011 to 18/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +5.85 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
05/05/2011	SW									+5.85	0.00			Firm, light brown (7.5YR 6/4), sandy SILT with some angular fine to medium gravel sized moderately decomposed rock fragments. (FILL)
									En A 0.50					
									En B 1.00	+4.85	1.00			Greyish brown (2.5Y 5/2), silty fine to coarse SAND with some angular to subangular fine to coarse gravel sized moderately decomposed rock fragments and occasional angular cobble sized quartz and moderately decomposed Siltstone. (FILL)
									En C 1.50					
05/05/2011									En D 2.00	+3.85	2.00			
06/05/2011			80	90										Firm, greyish brown (2.5Y 5/2), slightly sandy clayey SILT with occasional angular to subangular fine to medium gravel sized moderately decomposed rock fragments and occasional angular cobble sized quartz. (FILL)
	SW 3.10								2 3.00	+2.75	3.10			
	PW							3,3, 1,1,1,2 N=5	3 3.20				V	Extremely weak, light brown, dappled brown, completely decomposed SILTSTONE. (SILT)
								120 blows	4 3.50					
				44					En 5 3.55					
									6 4.00					
			80	95					7 4.05					
									8 5.05					
								3,3, 3,5,7,7 N=22	5.15					
									9 5.25					From 5.15m to 7.15m : With some iron and manganese stained joints, dipping 50° to 60°.
		0.30m at 18:00							10 5.55 5.60					
06/05/2011														
07/05/2011		0.76m at 08:00							11 6.05					
			80	95										
									12 7.05 7.15					
								3,5, 6,5,6,10 N=27	13 7.25					
								44 blows	14 7.55	-1.75	7.60			
				80					En 15 7.60				V	Extremely weak, light brown, completely decomposed SILTSTONE. (SILT with occasional angular fine to medium quartz gravel)
									16 8.05	-2.25	8.10			
									17 8.10				V	Extremely weak, light brown, dappled pinkish brown, completely decomposed meta-SILTSTONE with some iron and manganese stained relict joints, dipping 50° to 60° and 70° to 80°. (SILT)
			80	43				3.63×10^{-7} m/sec						
									18 9.10					
			80	80					19 9.20					

INSPECTION PIT

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	23/05/2011
CHECKED	E. Leung
DATE	24/05/2011

REMARKS
1. An inspection pit was excavated to 2.00m depth.
2. Falling head permeability tests were carried out from 8.50m to 10.00m and 29.50m to 31.00m depth.
3. An acoustic televiewer survey was carried out from 43.95m to 49.89m depth.
4. A piezometer was installed at 43.30m depth.

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH24
	SHEET 2 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM39	E 829588.70 N 841839.68	DATE : 05/05/2011 to 18/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 5.85 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW		80						20 10.20–10.30	-4.15	10.00		V	See sheet 1 of 6
07/05/2011		Dry at 18:00						5,8, 10,9,9,15 N=43	21 10.45					
09/05/2011		1.57m at 08:00							22 10.75–10.80					
11			80	95					23 11.20					
12									24 12.20–12.30					
		0.60m at 18:00						5,12, 11,10,11,15 N=47	25 12.40					
09/05/2011									26 12.70					
11/05/2011		1.55m at 08:00						126 b/s En	27 12.75					
13				100					28 13.20					
			80	95					29 13.25					
14									30 14.25–14.35	-8.50	14.35			
								6,10, 24,26,50/80mm (100/210mm)	31 14.36				V	Extremely weak to very weak, pinkish grey, dappled pinkish brown and light brown, completely decomposed meta-SILTSTONE. (SILT with occasional angular fine to coarse gravel)
15									32 14.66–14.71					
			80	95					33 15.20					
16									34 16.20–16.30					
								3,8, 10,15,15,23 N=63	35 16.40					
								311 b/s En	36 16.70–16.75					
17				100					37 17.00–17.05					
			80	95					39 17.20					
18									40 18.20–18.30	-12.45	18.30			
								5,10, 10,15,17,16 N=58	41 18.40				V	Extremely weak, light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT)
19		0.35m at 18:00							42 18.70–18.75					
11/05/2011														
12/05/2011		1.65m at 08:00							43 19.20					
			80	95										
20														

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
■ U100 undisturbed sample
▨ Mazier sample
▯ SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	23/05/2011
CHECKED	E. Leung
DATE	24/05/2011

REMARKS

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH24

CONTRACT NO. : GE/2009/15

SHEET 3 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM39	E 829588.70 N 841839.68	DATE : 05/05/2011 to 18/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 5.85 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW 20.30 HW		80					5,9, 13,21,22,26 N=82	44 20.20 20.30 45 20.40 46 20.70 20.75				V	See sheet 2 of 6
			80	95					47 21.20 48 22.20 22.30	-15.35	21.20		V	Extremely weak, light brown, dappled pinkish brown, completely decomposed meta-SILTSTONE with occasional iron and manganese stained relict joint, dipping 60° to 70° and 70° to 80°. (SILT)
								6,11, 12,11,12,15 N=50	49 22.49 50 22.79 22.84					
			80	80					51 23.20 52 24.20 24.30					
								5,10, 12,12,14,13 N=51	53 24.40 54 24.70 24.75					
			80	95					55 25.20 56 26.20 26.30					
								6,10, 20,22,40,18/35mm (100/260mm)	57 26.36 58 26.66 26.71					
			80	70					59 27.20 60 28.20 28.30	-22.45	28.30			
12/05/2011 13/05/2011		0.55m at 18:00 1.54m at 08:00	80	95				19,31/55mm 100/40mm (100/40mm)	61 62 29.30 29.40 63 29.57				V	Extremely weak to very weak, pinkish brown, dappled brown and light brown, completely decomposed meta-SILTSTONE. (Slightly sandy SILT with occasional angular fine to medium gravel)

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	23/05/2011
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DATE	24/05/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH24
	SHEET 4 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM39	E 829588.70 N 841839.68	DATE : 05/05/2011 to 18/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 5.85 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush % Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW							5.47 x 10^{-7} m/sec	64 30.30	-24.15	30.00		V	See sheet 3 of 6
31			80	95										
13/05/2011		Dry at 18:00						20,30/45mm 100/55mm (100/55mm)	65 31.30 66 31.40 67 31.53 31.58					
14/05/2011		2.95m at 08:00												
32									68 32.30					
33			80	95					69 33.30 33.40					
								20,30/55mm 100/60mm (100/60mm)	70 33.59					
34														
35			80	95					71 34.30 72 35.30 35.40					
								9,10, 11,15,17,57 N=100	73 35.50 74 35.80 35.85					
36										-30.45	36.30			
			80	80					75 36.30				V	Extremely weak, light brown, dappled pinkish grey, completely decomposed meta-SILTSTONE with some iron and manganese stained relict joints, dipping 50° to 60° and 60° to 70°. (SILT)
37		0.85m at 18:00												
14/05/2011		1.90m at 08:00							76 37.30 37.40					
16/05/2011								5,8, 9,14,15,25 N=63	77 37.50					
38									78 37.80 37.85					
									38.30					
39			80	0										From 39.30m to 39.40m : With closely spaced, quartz veins 7mm to 10mm thick, dipping 0° to 10° and 40° to 50°.
									79 39.30 39.40	-33.55	39.40			
			80	45					80				V	Extremely weak to very weak, light brown, dappled brown, completely decomposed meta-SILTSTONE. (SILT with much angular fine to coarse quartz gravel)
40														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	23/05/2011
CHECKED	E. Leung
DATE	24/05/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH24
	SHEET 5 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM39	E 829588.70 N 841839.68	DATE : 05/05/2011 to 18/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +5.85 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW									-34.15	40.00		V	See sheet 4 of 6
16/05/2011		1.15m at 18:00	80						81 40.40	-34.55	40.40			
17/05/2011		2.10m at 08:00						8,12, 17,15,68/50mm (100/200mm)	82 40.50	-34.65	40.50			From 40.40m to 40.50m : FAULT GOUGE. (SILT with some angular to subrounded fine to medium gravel sized quartz and moderately decomposed rock fragments and kaolin infilled 1mm to 2mm thick, dipping 0° to 10°.
41									83 40.80 40.85	-35.55	41.40			
			80	58					84 41.40				V	Extremely weak to very weak, light brown, dappled brown, completely decomposed meta-SANDSTONE. (Silty fine SAND with some angular fine to medium gravel)
42									85 42.40	-36.65	42.50			
			80	95					86 42.50				IV	Weak to moderately weak, greyish brown, dappled brown, highly decomposed meta-SILTSTONE. (Recovered as silty angular COBBLE with some angular fine to coarse gravel)
43									87 43.50					
								50/40mm 100/60mm (100/60mm)	88 43.70					
	HW 43.95								43.83	-38.15	44.00			
44							>20			-38.31	44.16		V	From 44.00m to 44.16m : No recovery, inferred to be completely decomposed SILTSTONE.
			85	61	64	56	NR			-38.41	44.26		III	From 44.16m to 44.26m : Extremely weak, light brown, completely decomposed meta-SILTSTONE. (SILT)
							NA		T2101				II	Strong, grey, dappled light brown, slightly decomposed meta-SANDSTONE. Joints are medium spaced, locally closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 30° to 40°, 40° to 50° and 50° to 60°. From 44.26m to 44.70m : Moderately strong, moderately decomposed SANDSTONE.
45									44.69	-38.85	44.70			
			85	100	100	91	2.8		T2101					
46									46.18					
							16.7			-40.70	46.55		III	From 46.55m to 46.70m : Moderately strong, moderately decomposed SANDSTONE.
			85	100	82	70	4.3		T2101	-40.85	46.70		II	From 46.70m to 46.73m : Quartz vein 30mm thick, dipping 10° to 20°.
47							>20			-41.15	47.00		II	Strong, grey, dappled light grey, slightly decomposed meta-SILTSTONE. Joints are closely spaced, locally very closely and medium spaced, rough and smooth planar, locally rough stepped, extremely narrow, clean, locally iron and manganese stained, dipping 10° to 20°, 50° to 60° and 60° to 70°. From 47.45m to 47.54m : With closely spaced quartz veins 5mm thick, dipping 10° to 20°. From 48.27m to 48.40m : Quartz vein 10mm thick, dipping 45°.
		0.90m at 18:00												
17/05/2011														
18/05/2011		2.05m at 08:00												
48							5.7							
			85	100	84	46			T2101					
							20.0							
49							3.3		49.05					
							>20							
			85	100	68	54	7.1		T2101					
50														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	23/05/2011
CHECKED	E. Leung
DATE	24/05/2011

REMARKS

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH24

CONTRACT NO. : GE/2009/15

SHEET 6 OF 6

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM39	E 829588.70 N 841839.68	DATE : 05/05/2011 to 18/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 5.85 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush % Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
18/05/2011									T2 IO! 50.12	-44.15 -44.27	50.00 50.12			See sheet 5 of 6 End of Investigation Hole at 50.12m.

51 52 53 54 55 56 57 58 59 60

Disturbed sample
Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
Water sample
En Environmental Sample

Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED T. C. Yip
DATE 23/05/2011
CHECKED E. Leung
DATE 24/05/2011

REMARKS

DRILLHOLE RECORD

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH25
	SHEET 1 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM39	E 829282.10 N 841639.93	DATE : 23/05/2011 to 27/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 13.44 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
23/05/2011	SW									+13.44	0.00			Firm, light brown (7.5YR 6/4), slightly sandy SILT / CLAY with occasional subangular to subrounded fine to medium gravel sized highly decomposed and moderately decomposed rock fragments. (COLLUVIUM)
									En A 0.50 En B 1.00 En C 1.50					
			85	95					2 2.50 2.60	+11.94	1.50			Firm, brown (7.5YR 5/4), dappled light brown, slightly sandy clayey SILT with some subangular to subrounded fine to coarse gravel sized moderately decomposed rock fragments. (COLLUVIUM)
								5,6, 7,8,8,9 N=32 94 blows	3 2.70 4 3.00					
				89					En 5 3.05	+10.39	3.05		VI	Firm to stiff, light brown, dappled reddish brown, slightly sandy SILT with occasional angular to subangular fine gravel sized quartz fragments. (RESIDUAL SOIL) From 3.50m to 3.55m : With some angular to subangular fine to medium gravel. sized quartz fragments.
	SW 4.00 PW		85	95					6 3.50 7 3.55					
								1,2, 2,3,3,4 N=12	8 4.55 4.65 9 4.75 10 5.05 5.10					
										+7.44	6.00		V	Extremely weak, light grey, dappled reddish brown, completely decomposed coarse ash crystal TUFF. (SILT with occasional angular fine quartz gravel)
			85	95				1.23×10^{-6} m/sec	11 6.00					
		0.65m at 18:00							En 42					
23/05/2011									12 7.00 7.10					
24/05/2011		4.35m at 08:00						1,1, 2,3,4,5 N=14 38 blows	13 7.20 14 7.50					
				100					En 15 7.55	+5.89	7.55		V	Extremely weak, reddish brown, dappled brown and light brown, completely decomposed coarse ash crystal TUFF with some iron and manganese stained relict joints, dipping 40° to 50° and 50° to 60°. (SILT with occasional angular fine gravel)
			85	60					16 8.00 17 8.05					
									18 9.05 19 9.15					
			85	95										
10														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	03/06/2011
CHECKED	E. Leung
DATE	07/06/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A falling head permeability test was carried out from 5.60m to 7.10m depth.
3. Two water samples were collected at 6.80m.
4. An acoustic televiewer survey was carried out from 28.81m to 34.43m depth.
5. A standpipe was installed to 10.00m depth.

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH25
	SHEET 2 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM39	E 829282.10 N 841639.93	DATE : 23/05/2011 to 27/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 13.44 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level +3.44	Depth (m) 10.00	Legend	Grade	Description
	PW		85					1,2, 3,4,5,6 N=18	20 10.15 10.25 21 10.35 22 10.65 10.70				V	See sheet 1 of 4
			85	80					23 11.60 24 12.60 12.70	+0.74	12.70		V	Extremely weak, greyish brown, dappled light brown, completely decomposed coarse ash crystal TUFF. (SILT with occasional angular fine gravel)
				100				2,2, 2,3,4,5 N=14 44 blis	25 12.80 26 13.10 En 27 13.15 28 13.60	-0.21	13.65		V	
			85	70					29 13.65 30 14.65 31 14.75				V	Extremely weak, light brown, dappled brown, completely decomposed metamorphosed coarse ash crystal TUFF. (SILT with occasional angular fine gravel)
24/05/2011		0.85m at 18:00	85	90					32 15.75 15.85	-2.41	15.85		V	
25/05/2011		4.70m at 08:00						2,4, 6,9,13,15 N=43	33 15.95 34 16.25 16.30				V	Extremely weak, grey, dappled light brown and greyish brown, completely decomposed metamorphosed coarse ash crystal TUFF. (SILT with some angular fine gravel)
	PW 16.72 HW								16.72	-3.28	16.72		III	Moderately strong, locally strong, light brown, dappled grey and brown, moderately decomposed metamorphosed coarse ash crystal TUFF. Joints are closely spaced, locally very closely and medium spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 40° to 50° and 50° to 60°. From 17.45m to 17.60m : Weak to moderately weak, highly decomposed TUFF.
			75	100	69	32	>20		T2 101	-4.01	17.45		IV	
										-4.16	17.60		III	
			75	100	74	46	4.6		17.92 T2 101					
							15.3		18.97					
			75	62	30	9	NI		T2 101	-5.88	19.32		IV	From 19.32m to 19.65m : Weak to moderately weak, highly decomposed TUFF.
							>20			-6.21	19.65		III	
							NR			-6.36	19.80		V	From 19.80m to 20.30m : No recovery, inferred to be

- Disturbed sample
- Piston sample
- U76 undisturbed sample
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- Water sample
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- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

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REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH25
	SHEET 3 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM39	E 829282.10 N 841639.93	DATE : 23/05/2011 to 27/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 13.44 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW		75	62	30	9	NR		T2 01	-6.56	20.00		V	completely decomposed TUFF. See sheet 2 of 4
									35 20.30	-6.86	20.30		V	Extremely weak, grey, dappled light brown, completely decomposed metamorphosed coarse ash crystal TUFF. (SILT with occasional angular to subangular fine gravel)
21			85	95					36 21.30 21.40					
								9,15, 14,14,21,23 N=72	37 21.50					
22									38 21.80 21.85					
									39 22.30					
23			85	55										
									40 23.30 23.40	-9.96	23.40		IV	From 23.30m to 23.40m : With some angular to subangular fine to medium quartz gravel.
24		1.20m at 18:00	85	0										Weak to moderately weak, light brown, dappled brown, highly decomposed coarse ash crystal meta-TUFF. (Recovered as slightly sandy angular to subangular COBBLE with some angular to subangular fine to coarse gravel)
	25/05/2011								41 24.00 24.10	-16.88	34.82			
	26/05/2011	5.19m at 08:00	70	97	68	61	>20		T2 01	-11.01	24.45		III	From 24.00m to 24.10m : With much angular to subangular fine to coarse quartz gravel.
							7.0		24.82	-11.38	24.82		III	Moderately strong, greyish brown, dappled light brown and brown, moderately decomposed metamorphosed coarse ash crystal TUFF.
25			70	89	0	0	NI		T2 01	-11.76	25.20			Joints are closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 0° to 10° and 30° to 40°.
							>20		25.38	-11.94	25.38			
			70	57	0	0	NI		T2 01	-12.29	25.73			From 24.35m to 24.45m : Quartz vein 20mm thick, dipping 40°.
26							NR		26.00	-12.56	26.00		V	Moderately strong, light grey, dappled light brown and brown, moderately decomposed QUARTZ VEIN. Fractured.
			70	100	50	24	NI		T2 01	-12.74	26.18		III	From 25.20m to 25.38m : Moderately strong, moderately decomposed metamorphosed TUFF.
							9.1		26.50	-13.29	26.73		III	From 25.73m to 26.00m : No recovery, inferred to be completely decomposed TUFF.
27			75	80	25	25	NI		T2 01	-13.46	26.90		IV	Moderately strong, light brown, dappled greyish brown, moderately decomposed meta-SANDSTONE.
							NR						V	Joints are closely to medium spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 50° to 60° and 60° to 70°.
							6.7		27.30	-13.86	27.30		III	From 26.73m to 26.90m : Weak, highly decomposed meta-SANDSTONE.
			75	59	49	41	>20		T2 01	-14.26	27.70		V	From 26.90m to 27.30m : No recovery, inferred to be completely decomposed meta-SANDSTONE.
28							NR		27.98	-14.54	27.98		III	From 27.70m to 27.98m : No recovery, inferred to be completely decomposed meta-SANDSTONE.
			75	80	23	19	19.2		T2 01	-14.80	28.24		V	From 28.24m to 28.50m : No recovery, inferred to be completely decomposed meta-SANDSTONE.
							NR		28.50	-15.06	28.50			
	HW 28.81		75	94	0	0	>20		T2 01	-15.39	28.83		IV	Strong, grey, streaked dark grey, spotted light grey, slightly decomposed metamorphosed coarse ash crystal TUFF. Joints are closely to medium spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, occasional clean, dipping 10° to 20°, 40° to 50°, 50° to 60° and occasional 60° to 70°. From 28.50m to 28.83m : Weak, highly decomposed TUFF.
							NI		28.83	-15.56	29.00		II	
							>20			-15.66	29.10		III	
29		4.76m at 13:00	75	56	47	18	12.5		T2 01	-15.86	29.30		II	
	26/05/2011								29.38	-15.96	29.40		III	
	27/05/2011	5.03m at 08:00	60	105	80	47	2.3			-16.11	29.55		II	
30														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
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- Water sample
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- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	03/06/2011
CHECKED	E. Leung
DATE	07/06/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH25
	SHEET 4 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	**CO-ORDINATES**	**W.O.NO.** GE/2009/15.22A
MACHINE & NO.	VBM39	E 829282.10 N 841639.93	**DATE :** 23/05/2011 to 27/05/2011
FLUSHING MEDIUM	Water	**ORIENTATION** Vertical	**GROUND LEVEL** + 13.44 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-16.56	30.00			
			60	100	80	47			T2101	-16.81	30.25		II	From 29.00m to 29.10m : Quartz vein 80mm thick, dipping 0° to 10°.
										-16.96	30.40		III	From 29.10m to 29.30m : Moderately strong, moderately decomposed TUFF.
									30.57				II	From 29.40m to 29.55m : Moderately strong, moderately decomposed TUFF.
31			60	100	84	64	8.1		T2101					From 30.25m to 30.40m : Moderately strong, moderately decomposed TUFF.
							>20							From 30.77m to 31.47m : With some pockets of quartz sized up to 170mm.
32							6.4		31.91					
			60	100	84	78	2.7		T2101					From 32.35m to 32.77m : With some pockets of quartz sized up to 100mm.
33									33.25					
							11.1							
34			60	100	80	67			T2101					
	27/05/2011	4.50m at 18:00					3.7		34.67	-21.23	34.67			
														End of Investigation Hole at 34.67m.
35														
36														
37														
38														
39														
40														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	03/06/2011
CHECKED	E. Leung
DATE	07/06/2011

REMARKS

DRILLHOLE RECORD

VIBRO	HOLE NO. KTN-BH26
CONTRACT NO. : GE/2009/15	SHEET 1 OF 2

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 829039.09 N 841061.47	DATE : 05/05/2011 to 07/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 9.24 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
05/05/2011	SW									+9.24	0.00			Brown (7.5YR 5/4), sandy SILT with occasional angular to subangular fine to medium gravel sized highly decomposed rock fragments. (COLLUVIUM)
									En A INSPECTION PIT 0.50					
									En B 1.00					
		Dry at 18:00							En C 1.50	+7.74	1.50			
05/05/2011														
06/05/2011		Dry at 08:00							1 2.50					Firm, light brown (7.5YR 6/4), dappled light grey and reddish brown, clayey SILT with occasional angular to subangular fine quartz gravel. (ALLUVIUM)
			70	96					2 2.60					
	SW 2.50								3 2.70					
	PW							2,2, 2,2,3,4 N=11	3.00	+6.19	3.05			
								43 bls	En 4 5 3.05					Light grey (N 7), silty / clayey fine SAND with occasional angular to subangular fine quartz gravel. (ALLUVIUM)
				96					3.50					
									6 7 3.55					
			70	35					4.55					
									8 4.65	+4.59	4.65			
				89				121 bls	9					Loose, light brown (7.5YR 6/4), dappled greyish brown, slightly silty / clayey fine to coarse SAND with some angular to subangular fine to coarse quartz gravel. (ALLUVIUM)
									10 5.10					
								2,2, 2,2,2,3 N=9	5.15					
									11 5.25					
									5.55					
									12 13 5.60					
			70	53				7.54 x 10^{-6} m/sec	6.60					
									14 6.70	+2.54	6.70			
								63 bls	En 15				V	Extremely weak, light brown, completely decomposed metamorphosed coarse ash crystal TUFF. (Sandy SILT with occasional angular fine gravel)
				67					7.15					
									16 7.20					
								3,4, 7,10,12,15 N=44	17 7.30					
		0.38m at 18:00							18 7.60					
05/05/2011									7.65					
07/05/2011		2.83m at 08:00												
									8.40	+0.84	8.40		III	
	PW 8.72						>20			+0.74	8.50		II	Strong, grey, spotted and streaked light grey, slightly decomposed metamorphosed coarse ash crystal TUFF. Joints are widely spaced, locally closely spaced, rough planar, tight to extremely narrow, clean and occasional iron stained, dipping 20° to 30° and 30° to 40°. From 8.40m to 8.50m : Moderately strong, moderately decomposed TUFF.
			70	97	81	73	10.0		T2 101					
									9.09					
							0.9							
			70	100	100	100			T2 101					
							8.3							
10														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	16/05/2011
CHECKED	E. Leung
DATE	17/05/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A constant head permeability test was carried out from 5.20m to 6.70m depth.
3. An acoustic televiewer survey was carried out from 8.70m to 14.22m depth.
4. A piezometer was installed at 6.10m depth.

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH26
	SHEET 2 OF 2

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 829039.09 N 841061.47	DATE : 05/05/2011 to 07/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 9.24 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush % Returns	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
			70	100	100	100			T2 01				II	See sheet 1 of 2
							3.0		10.50					
11			70	100	100	100			T2 01					
12									11.96					
			70	100	100	100	0.4		T2 01					
13									13.43					
							10.0							
14			70	100	100	91	0.0		T2 01					
	07/05/2011	0.50m at 18:00							14.43	-5.19	14.43			
														End of Investigation Hole at 14.43m.
15														
16														
17														
18														
19														
20														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	16/05/2011
CHECKED	E. Leung
DATE	17/05/2011

REMARKS

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH28

CONTRACT NO. : GE/2009/15

SHEET 1 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 829401.30 N 840606.10	DATE : 16/05/2011 to 21/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +4.00 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level +4.00	Depth (m) 0.00	Legend	Grade	Description
16/05/2011	SW													Firm, dark brown (7.5YR 3/4), slightly sandy SILT with occasional subangular fine gravel sized highly decomposed rock fragments and rootlets. (POND DEPOSIT)
									En A 0.50	+3.50	0.50			Firm. dark grey (N 3), slightly clayey SILT. (POND DEPOSIT)
									En B 1.00	+3.00	1.00			Firm, dark grey (N 3), dappled greyish brown, sandy clayey SILT with occasional subangular fine gravel sized quartz. (POND DEPOSIT)
									En C 1.50	+2.50	1.50			Soft to firm, dark grey (N 3), silty CLAY. (POND DEPOSIT)
			70	98					2.50	+1.40	2.60			
	SW 3.05 PW							1,1, 1,1,1,2 N=5	2.60 3 2.70					Soft to firm, dark grey (N 3), dappled grey, sandy clayey SILT with some angular to subangular fine gravel sized quartz. (ALLUVIUM)
				180				10 blows En	3.00 4 5 3.05					
			70	54					6 3.50 7 3.55	+0.45	3.55			Dense, light grey (N 6), dappled light brown, silty / clayey fine to coarse SAND with much angular to subangular fine to coarse gravel sized quartz. (ALLUVIUM)
				91				81 blows	8 4.55 9 4.65					
								2,3, 4,6,9,15 N=34	10 5.10 5.15 11 5.25					
								3.53×10^{-5} m/sec	12 5.55 5.60					
16/05/2011		0.50m at 18:00						104 blows	13 6.65					
17/05/2011		1.18m at 08:00		93					14 7.10 7.15	-3.15	7.15		V	Extremely weak, light brown, dappled brown, completely decomposed slightly metamorphosed coarse ash crystal TUFF. (Sandy SILT with much angular fine quartz fragments)
								2,3, 6,8,8,10 N=32	15 7.25 7.55					
				87				61 blows En	16 7.60 17					
									18 8.05 8.10					
			70	81					19 8.65					
		0.86m						3,5, 6,6,6,6	20 9.65 9.75 21 9.85					

Disturbed sample
Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
Water sample
En Environmental Sample

Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	30/05/2011
CHECKED	E. Leung
DATE	31/05/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A constant head permeability test was carried out from 5.50m to 7.00m depth.
3. A falling head permeability test was carried out from 18.70m to 20.20m depth.
3. An acoustic televiewer survey was carried out from 25.44m to 30.49m depth.
4. Piezometers were installed at 6.60m and 24.90m depth.

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH28
	SHEET 2 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 829401.30 N 840606.10	DATE : 16/05/2011 to 21/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 4.00 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush % Returns	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level -6.00	Depth (m) 10.00	Legend	Grade	Description
17/05/2011	PW	at 13:00						N=26	22 10.15 10.20				V	See sheet 1 of 4
18/05/2011		1.20m at 08:00							23 10.65					
11			70	96					24 11.65 11.75	-7.75	11.75		V	Extremely weak, light brown, completely decomposed slightly metamorphosed coarse ash crystal TUFF. (Sandy SILT with much angular fine to coarse quartz fragments)
12								7,15, 18,13,10,11 N=52	25 11.85					
								147 blS En	26 12.15 12.20	-8.20	12.20		V	Extremely weak, grey, spotted light grey, dappled light brown, completely decomposed slightly metamorphosed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular fine quartz fragments)
		1.08m at 18:00		84					27					
18/05/2011									28 12.65 12.70					
19/05/2011		1.17m at 08:00							29					
13			70	96										
									30 13.70 13.80					
14								3,4, 7,7,9,11 N=34	31 13.90					
									32 14.20 14.25					
									33 14.70					
15			70	84										
									34 15.70 15.80					
16								2,3, 7,10,19,23 N=59	35 15.90					
								41 blS En	36 16.20 16.25					
				100					37					
									38 16.70 39 16.75					
17			70	100										
									40 17.75 17.85					
18								4,6, 17,20,23,27 N=87	41 17.95					
									42 18.25 18.30					
								5.82 x 10^{-7} m/sec	43 18.75					
19			70	80										
									44 19.75 19.85					
20									45 19.90					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	30/05/2011
CHECKED	E. Leung
DATE	31/05/2011

REMARKS

DRILLHOLE RECORD

CONTRACT NO. : GE/2009/15	HOLE NO. KTN-BH28
	SHEET 3 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 829401.30 N 840606.10	DATE : 16/05/2011 to 21/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +4.00 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
19/05/2011 20/05/2011	PW	0.50m at 16:00 1.17m at 08:00						5,9, 21,31,34,14/25mm (100/250mm)	46 20.20 20.25				V	See sheet 2 of 4
21			70	32					47 20.75					
	PW 21.85								48 21.75	-17.85	21.85			
22	HW		70	98					49 21.85				V	Extremely weak, light brown, dappled brown, completely decomposed slightly metamorphosed coarse ash crystal TUFF with occasional iron and manganese stained relict joint, dipping subvertically. (Sandy SILT with occasional angular fine quartz fragments)
									50 22.85 22.95	-18.95	22.95			
23								6,7, 11,13,16,21 N=61	51 23.05				V	Extremely weak, grey, dappled light brown, completely decomposed slightly metamorphosed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular fine quartz fragments)
									52 23.35 23.40					
24			70	98					53 23.85					
25 20/05/2011 21/05/2011	HW 25.44	0.50m at 18:00 1.19m at 08:00						18,32/45mm 100/70mm (100/70mm)	54 24.85 24.95 55 25.09 56 25.14					
									25.44	-21.44	25.44		II	Strong, grey, spotted light grey, locally streaked light grey, slightly decomposed slightly metamorphosed coarse ash crystal TUFF. Joints are medium to widely spaced, locally closely spaced, rough planar and rough stepped, tight to extremely narrow, clean, occasional calcite infilled 1mm to 2mm, dipping 20° to 30°, 40° to 50° and 50° to 60°.
26			80	100	99	93	>20		T2101					
27							3.0		26.94					From 27.05m to 27.16m : With quartz veins 6mm thick, dipping 50° to 60°.
			80	100	100	94			T2101					
28							6.7		28.33					From 28.45m to 29.16m : With calcite vein 2mm to 3mm thick, dipping subvertically.
			70	100	100	92			T2101					
29							1.9		29.04					From 29.40m to 29.50m : With quartz veins 80mm thick, dipping 40°.
			70	100	100	100			T2101					
30									29.91					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	30/05/2011
CHECKED	E. Leung
DATE	31/05/2011

REMARKS

VIBRO

DRILLHOLE RECORD

HOLE NO. KTN-BH28

CONTRACT NO. : GE/2009/15

SHEET 4 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 829401.30 N 840606.10	DATE : 16/05/2011 to 21/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 4.00 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level -26.00	Depth (m) 30.00	Legend	Grade	Description
21/05/2011		1.13m at 18:00	70	100	100	95	7.9		T2101 30.73	-26.73	30.73		II	See sheet 3 of 4 From 30.30m to 30.55m : With closely spaced, calcite veins 1mm to 2mm thick, dipping 10° to 20°.
														End of Investigation Hole at 30.73m.

31 32 33 34 35 36 37 38 39 40

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED T. C. Yip

DATE 30/05/2011

CHECKED E. Leung

DATE 31/05/2011

REMARKS